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ABSTRACT

The Internet is a revolution unfolding before our eyes. There is concern that this revolution will increase class and racial differences and that a new digital divide between information haves and information have-nots will exacerbate existing levels of inequality in American society. This paper examines how the Internet has been tapped to deliver information about the schools in ways that either explicitly or implicitly try to cross the digital divide. First, the paper looks at several examples of websites that are trying to cross the digital divide by presenting local information about the schools. Second, the paper looks at the problems with harnessing the Internet as a tool for doing research about the schools. Third, the paper illustrates some of these problems by analyzing patterns of usage of one of these websites to see if actual usage shows patterns of inequality or expanded usage. The final section of the paper looks at the possibility of harnessing the Internet in a way that goes beyond the consumer-choice model embodied in most current school-based sites to a much more expansive citizen-based model of improving schools and, even more ambitiously, building stronger communities. (Contains approximately 87 references. (Author)

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National Center for the Study of Privatization in Education

Teachers College, Columbia University

Can Modern Information Technologies Cross the Digital Divide to Enhance Choice and Build Stronger Schools?

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October 2000

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

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J. Buckley

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Abstract- The Internet is a revolution unfolding before our eyes. Businesses in virtually every sector of the American economy are beginning to use the Internet to control purchasing costs, manage supplier relationships, streamline inventory, and, most importantly from our perspective, communicate with their customers more effectively. Besides the expanding use by businesses, an equally rapid rise in individual usage is also being registered. While already spectacular, this growth is just beginning since broadband Internet access for residential households is only in its nascent stages and Internet access via connections in schools, libraries and other public sites is already commonplace. As access becomes faster and as the tools for navigating the Web continue to improve, individuals will increasingly rely on the Internet as a means of gathering information about a whole range of topics and purchases. (*abstract continues below*)

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However, there is a concern that this revolution will increase class and racial differences, and that a new "digital divide" between information "haves" and information "have-nots" will exacerbate existing levels of inequality in American society. At the core of this paper is the examination of how the Internet has been tapped to deliver information about the schools in ways that (either explicitly or implicitly) try to cross the digital divide.

The paper has four parts. First we look at several examples of web sites that are in fact trying to cross the digital divide, by presenting local information about the schools—a service of central importance to low income parents and communities. Second, we look at the problems with harnessing the Internet as a tool for doing research about the schools. Third, we illustrate some of these problems by analyzing patterns of usage of one of these web sites to see if actual usage shows patterns of inequality or expanded usage.

These aspects of our analysis explore *existing* attempts to cross the digital divide by providing better information about schools to parents. To varying degrees, these attempts follow practices common to Internet sites run by commercial firms and, at bottom, they are designed to provide information to parents allowing them to shop for schools the same way that *cars.com* allows consumers to shop for a car or *buy.com* a walkman.

However, we argue that the roots of the Internet as a commercial medium and as a means of supplying information to consumers have to date limited its role in creating better schools. In the final section of the paper, we look at the possibility of harnessing the Internet in a way that goes beyond the "consumer choice" model embodied in most current school-based sites to a much more expansive "citizen based" model of improving schools and, even more ambitiously, building stronger communities.

We argue that present methods of employing the Internet as an information tool that treats parents as consumers of information are too timid. Instead, we argue for a much more ambitious use of the Internet's interactive and point-to-point capacities to create tools for building *local communities* and for training parents not to be only better consumers but also better citizens. And we argue that *local schools* provide a venue in which to tap these community-building possibilities.

The Occasional Paper Series of the National Center for the Study of Privatization in Education (NCSPE) is designed to promote dialogue about the many facets of privatization in education. The subject matter of the papers is diverse, including research reviews and original research on vouchers, charter schools, home schooling, and educational management organizations. The papers are grounded in a range of disciplinary and methodological approaches. The views presented in these papers are those of the authors and do not necessarily represent the official views of the NCSPE.

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The Internet is a revolution unfolding before our eyes. Businesses in virtually every sector of the American economy are beginning to use the Internet to control purchasing costs, manage supplier relationships, streamline inventory, and, most importantly from our perspective, communicate with their customers more effectively (U.S. Department of Commerce 1998, 2). Besides the expanding use by businesses, an equally rapid rise in individual usage is also being registered. For an idea of the magnitude of the growth, consider the following pieces of information: In 1993, fewer than 5 million Americans were connected to the Internet, by 1997 that number grew to over 60 million. Perhaps even more startling is that in the second quarter of 1999, about 45 million individual users signed on to the Internet in a given week, one year later that approached 55 million individual users per week! Concurrently, traffic on the Internet has been doubling every 100 days. While already spectacular, this growth is just beginning since broadband Internet access for residential households is only in its nascent stages and Internet access via connections in schools, libraries and other public sites is already commonplace.

As this diffusion occurs, the Internet is fast becoming a major source of information for consumers seeking information about the products they are considering buying. According to Maddox (1997), about 90% of web users are seeking news or information, and they are increasingly getting not only text, but also video and audio clips, maps, and other in-depth information. Similarly, the Pew Research Center reports that the number of Americans who are going online at least once a week for news increased by 300 percent between 1996 and 1998 (Associated Press 1998). While still somewhat "clunky," new tools are making the Internet more user-friendly and easier to navigate. As these tools are perfected and as broadband connections proliferate, individuals should increasingly rely on the Internet as a means of gathering information about a whole range of topics and purchases.

The Internet and the Schools

Not surprisingly, increasing numbers of businesses, not-for-profit organizations and researchers are looking to harness the Internet to affect the way in which schools are run and educational services delivered. These efforts are often linked directly to the growing number and range of options being presented to parents via intra-district choice, inter-district choice, charter schools and vouchers. There is also clearly money to be made on the Internet—for many entrepreneurs, the large number of students in the United States, and their parents, look like a huge

consumer market just waiting to be tapped. For other entrepreneurs, the vast number of schools presents opportunities for the equivalent of the rapidly expanding business-to-business ("B2B") Internet economy (that is, rather than targeting parents and students as consumers, the targets are schools and school districts as "producers" of education). Given these changes and opportunities, clearly the next few years will see a growing number of individuals and organizations trying to deliver school-related products over the Internet.

However, there is also a concern that this revolution will increase class and racial differences, and that a new "digital divide" between information "haves" and information "have-nots" will exacerbate existing levels of inequality in American society. Analysis of the digital divide has developed in two related paths. First analysts are concerned with inequalities in the distribution of hardware and access between different income and racial groups. Socioeconomic status clearly drives Internet usage—with usage increasing dramatically with income and education.[1] There are also race/ethnicity effects—at every income level blacks and Hispanics are much less likely to be using the Internet compared to whites and others (predominantly Asian-Americans). The issue of access may become more serious even as the price of hardware drops—because as broad bandwidth connections proliferate, the high costs of DSL lines, cable modems, or other such high-speed connections can create further entry barriers for low income individuals, despite the falling cost of computers.

More recently, even as evidence has emerged showing that the hardware differences are narrowing and usage patterns converging, some analysts have now identified what the Children's Partnership calls the "digital divide's new frontier"—the lack of content appropriate for low-income and underserved Americans. According to the Children's Partnership:

> Most studies of access have focused on the gap between those who can afford the hardware and software they need to go online and those who can't. A new dimension of the 'digital divide' is beginning to take shape, however—one with a profound impact on young people and those who guide and teach them: content....
>
> The Children's Partnership has found that it is as important to create useful content on the Internet—material and applications that serve the needs and interests of millions of low-income and underserved Internet users—as it is to provide computers and Internet connections (Children's Partnership 2000, 12).

[1] We are taking the existence of the digital divide as a "given" and do not explore the extent of the divide in this paper. However, in Appendix 1, we provide some data on Internet usage patterns that show the extent of the divide by income and by racial identification.

The Children's Partnership has identified four separate dimensions to this content-based digital divide. According to their survey of low-income individuals and their analysis of the Internet, most sites:

1) Lack local information about communities, especially the absence of usable information about low cost housing, local employment opportunities, and the schools.
2) Do not overcome literacy barriers, since the vast majority of information on the Internet is written for an audience that has average or advanced literacy skills.
3) Do not overcome language barriers: almost 90 percent of the information on the Internet is written in English.
4) Lack cultural diversity in content.

While we will try to accomplish several tasks in this paper, at the core of our argument and analysis is the examination of how the Internet has been tapped to deliver information about the schools in ways that (either explicitly or implicitly) try to cross the digital divide.

The paper has four parts. First we look at several examples of web sites that are in fact trying to cross the digital divide, by presenting local information about the schools—a service of central importance to low income parents and communities. Second, we look at the problems with harnessing the Internet as a tool for doing research about the schools. Third, we illustrate some of these problems by analyzing patterns of usage of one of these web sites to see if actual usage shows patterns of inequality or expanded usage.

These aspects of our analysis explore *existing* attempts to cross the digital divide by providing better information about schools to parents. To varying degrees, these attempts follow practices common to Internet sites run by commercial firms and, at bottom, they are designed to provide information to parents allowing them to shop for schools the same way that cars.com allows consumers to shop for a car or buy.com a walkman.

However, we argue that the roots of the Internet as a commercial medium and as a means of supplying information to consumers have to date limited its role in creating better schools. In the final section of the paper, we look at the possibility of harnessing the Internet in a way that goes beyond the "consumer choice" model embodied in most current school-based sites to a much more expansive "citizen based" model of improving schools and, even more ambitiously, building stronger communities. We argue that present methods of employing the Internet as a information tool that treat parents as consumers of information are too timid. Rather, we argue for a much more ambitious use of the Internet's interactive and point-to-point capacities to create tools for building

local communities and for training parents not to be only better consumers but also better citizens. And we will argue that *local schools* provide a venue in which to tap these community-building possibilities.

Part 1: Harnessing the Internet to Enhance Parent Choice

In this section, we will explore in detail three school-focused Internet sites. We begin by comparing the sites and identifying the different strategies they employ as they try to present comparative data about schools to parents. One of our goals in this analysis is to highlight both the benefits and the limits of existing attempts to harness the Internet for improving schools, but we also have a practical goal: as the Internet revolution continues to unfold, many readers may be tempted to create such sites for their communities or their own research. We believe that there are lessons that can be extracted from these sites that will help in those efforts.[2]

An Introduction to the Sites

In this section we focus on three sites: *DCSchoolSearch.com*, EPIC (*www.uwm.edu/EPIC*), and *GreatSchools.net*. We will discuss some of the similarities of the sites, but we will also highlight major differences in the geographic scope covered by the sites and in the way in which critical questions about presenting school data are handled.

The first two sites focus on specific cities (the District of Columbia and Milwaukee, respectively) and each was created in response to the expansion of school choice in that city. DCSchoolSearch.com has information on about 200 schools, all in the District of Columbia. The site includes information on all the "traditional" public schools plus the 30-odd public charter schools that now enroll approximately 10 percent of the District's school age children. EPIC (Empowering Parents for Informed Choices in Education) is somewhat larger: it has information on about 270 schools, of which about 165 are "traditional" public schools and the remainder are sectarian or alternative schools. The difference in coverage is at least partly driven by the nature of the choice programs in the two cities—the voucher program in Milwaukee allows children with vouchers to attend private sectarian schools (so these schools are included in the EPIC site), while the major publicly funded alternative to traditional public schools in DC are the rapidly growing population of charter schools.

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[2] In the interest of full disclosure, one of the sites we studied, *DCSchoolSearch.com*, was created by one of the authors—Mark Schneider—and both Schneider and Buckley are involved in researching the data generated by the study. If you detect a bias in the following discussion, it may flow simply from the greater amount of information we have about that site compared to the others—but it may also flow from pride of ownership.

DCSchoolSearch.com remains focused on just the city proper. While EPIC has plans to expand its geographical scope to include the suburbs, it has no coverage of or visibility in the suburbs at present. If EPIC represents an expansion over DCSchoolSearch.com, GreatSchools.net operates at a different order of magnitude: it has information on over 8000 schools throughout California. With support from several private foundations, it has expanded its coverage to include Arizona, where charter schools are rewriting the choice landscape. GreatSchools has information only on public schools and includes no information on private alternatives.

The Mission of the Internet Sites

As its name implies, *DCSchoolSearch.com*, is focused on providing information to parents in the District of Columbia, who are faced with an expanding universe of choice based on the rapid expansion of charter schools and a slowly expanding system of intra-district choice. From its web page, its mission is to:

- provide parents, grandparents, guardians, and students with important information when choosing a school;
- help everyone learn more about the District's public schools, including magnet schools, their own neighborhood schools and public charter schools; and
- help educators learn what matters in school choices.

DCSchoolSearch.com was a joint effort of a social scientist, Mark Schneider, and two not-for profit organizations in DC, the 21st Century School Fund and Friends of Choice in Urban Schools, (FOCUS). Because it is ultimately a research-oriented project, Schneider and his partners were able to get funding from the Smith Richardson Foundation and the National Science Foundation. The site was "rolled out" in November of 1999 and cost about $200,000 to design, implement and keep on line through the 1999-2000 school year. At this time, funding to keep the site alive is a problem—EPIC faces a similar problem.

As noted, there is a strong research component to the DC site and all users are asked to fill out a very short (five question) profile in order to use it. Patterns of movement through the site are tracked. Individuals who supply their e-mail address and permission to be contacted have also been surveyed via e-mail to get more detailed information about their attitudes toward the schools and their school choice behavior (more about this below).

The EPIC site is focused on the Milwaukee school system, where a voucher system has increased the number and range of schools that parents can choose from.

According to its home page:

- EPIC is designed to help you make informed decisions about your children's education.
- EPIC is an independent resource for information about public, private and religious K-12 schools in Milwaukee. You can easily use the EPIC website to look for schools that best fit the needs of your children, but EPIC collaborators recommend school visits before making any final decisions.

DCSchoolSearch.com was based on a partnership between a university-based researcher and two not-for-profit agencies; EPIC relies on an even more complex partnership including government agencies (Milwaukee's Office of the Mayor, the Milwaukee Public Library, the Milwaukee Public Schools), religious organizations (the Archdiocese of Milwaukee, the Missouri Synod (Lutheran Schools), Wisconsin Evangelical Lutheran Synod (Lutheran Schools)), not-for-profit organizations (the Corporation for National Service, PAVE (Partners Advancing Values in Education), POWER (People Organized Working for Educational Revolution)), and universities (University of Wisconsin-Milwaukee's Center for Urban Initiatives and Research and Marquette University's Institute for the Transformation of Learning).

In the summer of 2000, the site finished its second full school year and costs about $100,000 per year to operate. Three local foundations helped provide start-up costs, but there is no permanent funding—and funding has become a perennial issue. Even though social scientists were involved from the beginning of the site design, there is no specific research component built into the project.

Not surprisingly, GreatSchools' mission is similar to both of these other sites. According to its web page, GreatSchools, Inc. is dedicated to:

- Helping parents and community members understand, support, and improve public schools
- Helping parents identify and choose schools for their children
- Helping educators learn from other schools and assess and promote their own schools' quality.

While the missions of all these sites are similar, DCSchoolSearch.com and EPIC are the equivalent of "mom-and-pop" operations compared to GreatSchools.net. Launched in September 1998, GreatSchools.net features school profiles for over *8000* public schools in the state of

California. Their staff dwarves the other sites: GreatSchools has 8 full time and 2 part time employees and costs are around $50,000 per month.

Housed in Silicon Valley, GreatSchools has tapped into local skills and the capital built up during the "dot com" revolution of the 1990s—Silicon Graphics is one of their major supporters, and GreatSchools has continuing support from both the Hewlett and Stewart Foundations. Recently, GreatSchools was given about $2.5 million from the Fisher Foundation to expand their coverage to include Arizona.

Given the size of the site (and perhaps the higher literacy rates and Internet sophistication of its core parent clientele in Silicon Valley), the number of visitors to GreatSchools.net dwarfs the other two sites. While staff were somewhat reluctant to give exact numbers, GreatSchools has "tens of thousands" of hits per month, with a peak of 50,000 hits in January of 2000, when GreatSchools updated its database to include the results of the California Academic Performance Index. GreatSchools did not say how many different *users* (rather than visits) it had. In contrast, EPIC has had about 5000 different users since it opened in October of 1998 and DCSchoolSearch.com has had about 8000 hits and a little more about 2000 different users between its opening in November of 1999 and June of 2000.

Issues in Constructing a Schools-Based Web Site

Perhaps the most fundamental fact common to these three sites is that they are all *private* enterprises not government ones.[3] Since these are private sites, much of the information on them is not officially "audited." Moreover, there are no mandatory reporting requirements and the site organizers have no coercive power over the schools or the districts they cover. In turn, there is considerable variation in the information they present and the way in which the data are presented. Looking across these sites and drawing on our own experience with DCSchoolSearch and from conversations with the creators of these other sites, it is possible to identify a set of common issues to which we now turn.

Sources and Range of Data

Obviously the fundamental issue in any site designed to disseminate information is the types of data to be included. Related issues include the source of the data and the display of the data.

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[3] To be sure, there are government run sites that have searchable data bases. One of the largest, http://nces.ed.gov/ccdweb/school/school.asp, has information on over 90,000 public schools throughout the country. But most sites are neither user friendly nor comparative. For example, compare the "official" DC public school site http://www.k12.dc.us/dcps/schools/schools_frame.html with DCSchoolSearch.com.

Data to Include and its Sources

The issue here is to balance between the extent a site relies on readily available data, usually collected by the state or local education department of education, compared to the extent to which the developers try to provide data that are not centrally located. Clearly, gathering this second type of data requires extensive legwork often centered on developing the cooperation and participation of individual schools and the local school district. The balance between centrally collected information and other data affects the number of schools that can be covered and the range of data that can be presented.

At one extreme, GreatSchools.net by far has the largest number of schools, but its California database encompasses only information published by the State Department of Education. While there are a large number of indicators in the database, the number of "fields" of information is actually substantially fewer than in other sites. In turn, many of the details of school programs that are critical to parents are not included in GreatSchools.

For example, one of the aspects of schools that parents are most concerned about is the availability of an extended day program. Yet these data are not in the GreatSchools.net database—because they are not centrally collected. Similarly, the GreatSchools site does not contain data on the school philosophy and mission, on athletics, PTA membership, or any other distinctive characteristics of individual schools. Clearly GreatSchools has traded breadth for depth.

Why Can't You Have Both Breadth and Depth?

Both EPIC and DCSchoolSearch.com have tried to provide more in-depth coverage, and they have use the same strategy to gather these data—both have asked central school administrators and principals to supply more detailed data. And both have had the same results—discouraging to say the least. Efforts to gather these kinds of specific school-level data are plagued by a number of constraints, ranging from the antiquated management information systems run by the public schools systems in both cities to the lack of technical competency on the part of many principals (yet another "digital divide") to the simple fact that principals are often too busy to answer the many queries they get from parents, the central administration, researchers, etc.

We should note that these difficulties are probably not simply a function of the small staff size of EPIC and DCSchoolSearch.com. GreatSchools has also tried to cultivate principals and superintendents to gather these more detailed data. Despite the size of their operation and the fiscal resources supporting them, cultivating principals across an entire state is even more difficult than

cultivating principals in a single city, and their "response rate" is even more dismal than that of the Milwaukee and DC teams.

There are many problems with trying to get principals to supply information. First, the simple act of contacting principals can be difficult. The central administrators of most school districts discourage any "unauthorized" e-mail contacts between researchers, community groups and "their" principals. In DC, we had the e-mail addresses of every principals in the school system and we e-mailed principals information about DCSchoolSearch.com several times while we were constructing our database. Our e-mails included information about DCSchoolSearch.com, describing the purpose of the site and describing the kinds of information about their schools we wanted from them. We offered technical assistance in filling out the forms on-line and had a "hot line" for them to call with their problems. But even this intense "hand holding" was not sufficient.

One of the first obstacles we encountered was the resistance by the central administration to this effort—in fact, the central administration ultimately warned principals against responding to e-mails from Stony Brook researchers. This central opposition pushed down individual school participation—and led to holes in our database that could never be filled.

Similarly, the role of top administrators was critical in Milwaukee. When EPIC was first conceived, the superintendent was not very supportive; however, a new superintendent eventually came into office and supported EPIC. In this regard, EPIC had a major advantage over DCSchoolSearch.com, where top administrators never supported the project. However, no matter how much enthusiasm the superintendent showed for EPIC and how much pressure he exerted to get his principals to cooperate, there was still considerable "slippage" between the support of the central administration and the actions of the principals who have the information and need to enter it. But even at the central administration level and even given support, the central administration was often less than efficient in its assistance. For example, EPIC drafted a letter from the superintendent to the principals urging them to provide the data, but it took more than three months for the letter to actually get sent out.

Even if the attitude of the central administration and principals changes in support of such sites, another constraint emerges—the technological acumen of principals. The strong initial resistance to EPIC (and to a lesser extent DCSchoolSearch.com) moderated over time as both sites became more familiar and showed no signs of going away. Moreover, as competition via vouchers and charters increased in both districts, some principals began to recognize the need to market themselves. But here is where the administrative digital divide factors in: staff in both Milwaukee

and DC discovered that it was hard to get principals to enter the data because many were not computer literate. Even though both EPIC and DCSchoolSearch.com allow principals to enter data on line, most information comes back via paper. This technological limit is not fixed by the turnover in principals—even if the replacement is more technologically sophisticated, the new principal may not be supportive of the effort and at minimum staff at both places found that new principals need to be "educated" about the importance of the project.

School-Based Web Sites as Management Information Systems

In Milwaukee and DC, efforts to provide reliable information were hampered by the inability of the central school administrations to supply data in a timely fashion. In neither city did the public school system possess a management information system that integrated the various pieces of data into a single database. In fact, the DCPS has failed to even accurately count their students.[4] In addition, in DC we were not able to get accurate counts of the number of teachers in any school. Moreover, when we asked one central administrator for data on the extended day programs, he asked us to supply it to him once we gathered it!

In an unanticipated outcome, both EPIC and DCSchoolSearch.com have become management information systems for their respective districts. As their databases have improved and the range of the data collected and made available in one spot has expanded, the number of principals and other school administrators using the sites has increased—but we hope that it is not principals looking for data about their own schools.

Verifying Data

This is a critical issue for both local sites—and one that is avoided by GreatSchools.net. EPIC does not verify the data that it presents. This has been an issue raised frequently by librarians, who want to make sure that the data are accurate before they help parents access the site. DCSchoolSearch.com has two types of data. The first type of data it includes is "official" data from the DCPS. These include test scores and student demographics. These data are not open to change by individual principals. However, DCSchoolSearch.com does not verify the individual school-level

[4] The 1996 report on public education in the District of Columbia, "Children in Crisis" reports that "the DCPS does not have an accurate count of its students. Estimates vary between 75,000 and 81,000 students. The National Center for Education Statistics (NCES) found a discrepancy of 20.6% between the 1990 census and the number of students reported by DCPS. The General Accounting Office (GAO) also has questioned DCPS' record keeping. After the 1995 sample student enrollment count authorized by the Superintendent identified 80,450 students, the GAO stated that its usefulness for validating enrollment was 'limited because of mistakes made in selecting the sample.' GAO estimated that DCPS' Student Information Management System may contain approximately 5,000 obsolete or duplicative student records." (District of Columbia Financial Control Board 1996)

data that are reported by principals (for example, whether or not the school has an extended day program or information about the local parent association).

The Particular Problem of Test Score Data

One central dimension faced by all Internet school sites is how to present test score data. This is a centerpiece of the database collected by GreatSchools (its period of greatest use to date was immediately after it included new test score data) and is central to the data provided by DCSchoolSearch.com. In stark contrast, EPIC does not have any test data on its site at all—they argue that there is no agreement on the validity of test data and that there are intense arguments over how to display results. Also EPIC has many sectarian schools in their database and one issue that plagues all school information systems that span sectors is the radically different reporting requirements affecting schools in each sector.

As noted, both GreatSchools and DCSchoolSearch.com provide test scores. And like any organization that is allowing comparisons across schools based on such scores, each was faced with the issue of how to standardize school performance relative to the "inputs" of the school. There are at least two fundamental dimensions to this task: How do researchers standardize for different population composition of schools? How do we make sure that we are not "unfair" to schools that have high value added, even if their absolute level of performance is not high?

Perhaps the only way to address these concerns is to define an educational "production function" and assess how a school is doing relative to its resources, including its population. However, scholars are far from being able to agree on such a production function (for example, Clotfelter and Ladd (1996) use *nine* different measures of school performance to assess performance among fifth graders in South Carolina and many of the indicators are not highly correlated). Moreover, even if we can agree on a production function to control for differences in student input, there are still difficult questions. How, for example, do we communicate this information in a format that parents can understand?

Perhaps not surprisingly, GreatSchools.net solved the production function issue by adopting California state education department procedures. In California, the state education department creates an Academic Performance Index that combines the several subjects and grade level test results into one number, with a possible range of 200 to 1000 with the national median falling at 655 and the state median at 630. GreatSchools then presents verbally and graphically the ***absolute*** standing

of every school, but also follows state procedures to produce a comparative analysis.[5] See, for example, the profile for Bay Farm Elementary School in Alameda, included as Appendix 2. By following state procedures and relying fully on state reported data, GreatSchools can cover a large number of schools.

We struggled with the issue of test scores in constructing the DC site. Ultimately, we decided that the emphasis on "standardized" comparative data is wrong—and that parents should be trying to get their child into the highest performing school possible, regardless of the quality of the inputs and the value added. As a result DCSchoolSearch reports the "raw" numbers and not any value-added adjusted data.

We believe that this issue is critical for anyone considering a school-based Internet site.

Spanning the Digital Divide

Let us take for granted that education is an important local service so the fact that all these sites are providing basic information about the schools meets the first test laid out by The Children's Partnership in their analysis of the digital divide. How do these sites fare on the other three components, literacy barriers, language barriers, and cultural diversity?

While all these sites have tried to incorporate graphics and a user-friendly interface (and we know exactly how hard we tried in DCSchoolSearch.com), they are all still highly text-based. Our original plan for the DC site was to use audio and video streaming to deliver better content, but we immediately ran into the technological constraints of the digital divide. First, the technology for audio and video streaming is still quite clumsy and, more importantly, if these services are delivered over telephone lines rather than high speed connections, downloading these big files is time consuming and frustrating. So despite our best intentions, we ended up with a site that is more static than we wanted and more text- rather than graphic-based. I would judge the other sites also as too wordy (especially GreatSchools) and not dynamic enough. Thus none of the sites pass the literacy barrier test.

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[5] GreatSchools does not explain the system in great detail. On the web site it explains its comparative procedure in the following way: "For each school a school characteristics index is created, including pupil mobility, pupil ethnicity, pupil socioeconomic status, percentage of teachers who are fully credentialed, percentage of teachers who hold emergency credentials, percentage of pupils who are English language learners, average class size per grade level and whether schools operate multi-track year-round educational programs. The State then compares each school with the 100 schools most like it on the school characteristics index and assigns a rank based on the API. Thus, a school could be in the first rank on the state index but the tenth rank on the similar schools index."

EPIC does better on the third criterion—overcoming language barriers. It has a Spanish language version, but warns that it is a work in progress. Neither GreatSchools nor DCSchoolSearch.com has alternate language versions. We had hoped to put up a Spanish language version of DCSchoolSearch.com but, quite frankly, we had so many other problems simply getting the data and negotiating with the DCPS, the charter schools, and other public school officials that "net fatigue" wore us out. We should note that it took EPIC well over a year of being on line before they started to develop a Spanish language version, and we still have plans (read "hopes") to translate the DC site.

Finally, the fourth criterion set out by the Children's Partnership—cultural diversity—is also the most ambiguous and may not even apply to the mission of any specific school information site. Nevertheless, we will argue in the final section of this paper that there are in fact different tools and conceptual approaches to the Internet that can be tapped to create stronger school-based communities, which can in turn reflect the full diversity of neighborhoods.

Outreach Activities to Span the Digital Divide

Both EPIC and DCSchoolSearch.com have tried extensive outreach activities to inform parents about these sites and the importance of becoming an informed consumer of education. But staffs at both sites have all discovered how hard it is to reach the target communities.

In DC, we partnered with the metro system and put posters in over 300 DC buses. We had a slide shown in the Union Station multiplex cinema, mixing in information about our service with slides for the local laser eye surgery, the local carpet store, etc. We hired a PR company and had press coverage, with stories in the Washington Post and several local television and radio stations, as well as on some local TV stations. These had some "one time" effects boosting usage—in fact our biggest surge in hits was after a local TV show focused an entire half-hour slot on DCSchoolSearch.com. Even though this was at 7 AM on a Sunday morning, over 20 people signed on to the site at the end of the broadcast.

However, the media campaign was only a sideshow to the slogging through the endless cycle of community meetings, parent groups, church groups, and school fairs. This was an incredibly labor-intensive activity, consuming significant amounts of staff time at both EPIC and DCSchoolSearch.com. Unfortunately, staffs at neither place have been able to identify "wholesale" methods of making the contacts, conducting training, and keeping interest alive in these sites.

The key lesson here is that Internet-based school sites do not live in a "field of dreams"(build it and they will come), but require hard work to achieve even limited penetration into an underserved, low income, and minority population.

Part 2: Doing Social Science Research Using School- Based Internet Sites

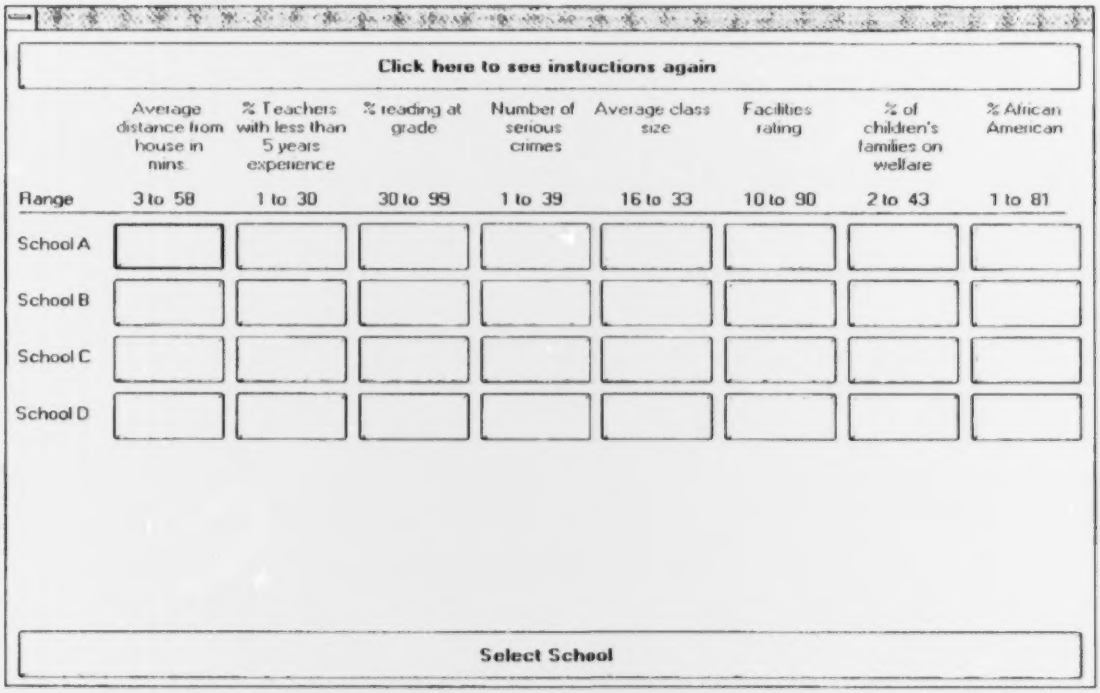
DCSchoolSearch.com was specifically designed as a research tool and our experience here is cautionary. We were not the first people to be lured into viewing the Internet as a revolutionary tool that could be harnessed to transform old ways of doing things (in fact, large numbers of people have both made lots of money and lost lots of money following this belief) and we probably won't be the last.

Gathering Data Is Affected By Technology

When Schneider designed DCSchoolSearch.com, it seemed a perfect tool to combine an action component and a research component—that is, the site was designed to do something good for parents (by providing them information allowing them to make better choices) while contributing to the ongoing debates about school choice by applying various social scientific and behavioral decision theoretic concepts and models to understanding how parents search for and use information in the school choice process. Indeed, the design of the DCSchoolSearch.com site was structured to mimic an information board, one of the classic tools of behavioral decision theory.

In Figure 2.1, we present an example of what a computer-based information board might look like to study how parents might select information about schools. As is the norm in these types of experiments, the alternative schools would be listed as rows and the performance of each school on each attribute (e.g., safety, reading scores) would be listed in columns. In a laboratory setting, a parent would be instructed to use the mouse to point to a box that contains information that she wanted to know and then click the mouse to reveal that information. The parent could keep the box open as long as she wanted and then point to another box to learn more information about a school. Ultimately the parent would then be asked to choose a school that she thought best.

Figure 2.1: Example of an Information Board

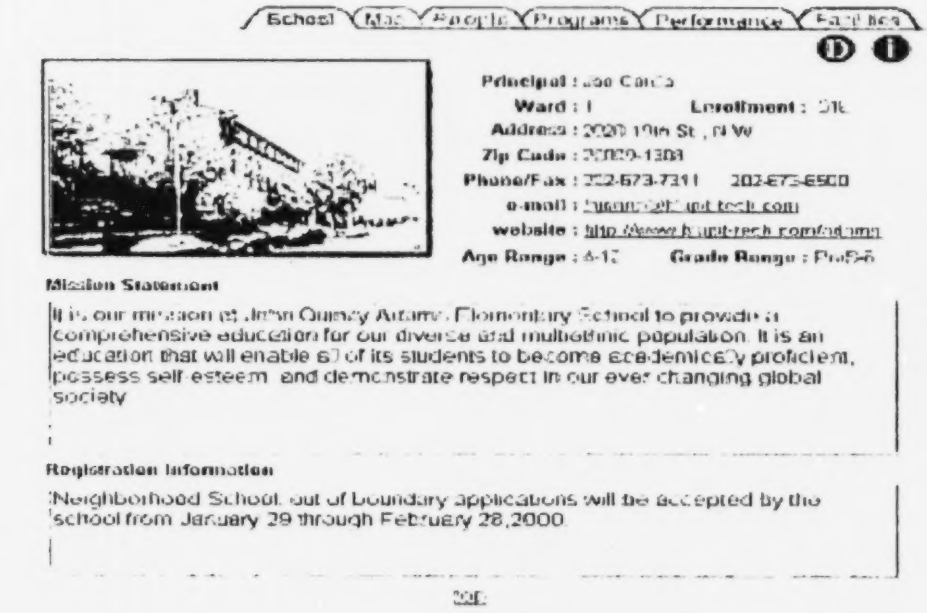


In a laboratory situation, the pattern of movement would be traced and the time spent in each box would be recorded. Using a variety of statistical techniques, researchers would use the pattern of search *and* the time spent accessing each box to test various models of decision making and to assess the efficiency of decision making of different types of parents.

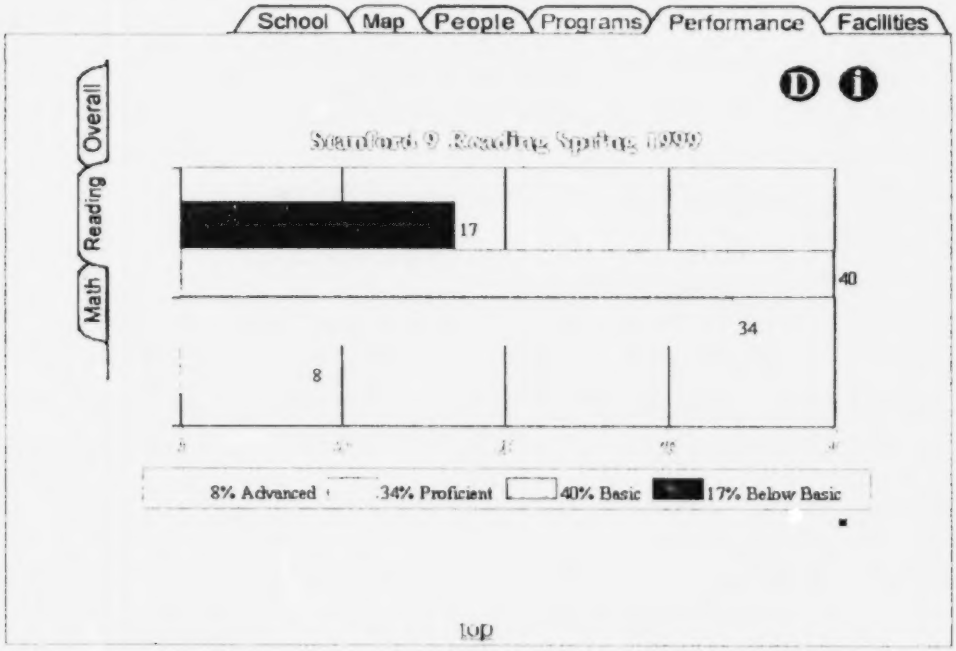
As is evident in Figure 2.2, the structure of the DCSchoolSearch.com site is conceptually quite similar to the classic information board. Parents can use a variety of search mechanisms to narrow down their choice set (e.g., they could use a preprogrammed search function to find all charter schools in the district or to find all elementary schools where more than 50 percent of the students are reading and doing math scores at grade point). This search thus functions to create the list of alternatives essential to tests of choice behavior.[6]

[6] Note that in contrast to the traditional decision board in which the alternatives are usually limited to a set constructed by the researcher, in DCSchoolSearch, the set of alternatives is dynamically constructed by the parent and presents real world alternatives.

Figure 2.2: DCSchoolSearch Sample School Profile Pages


School
Map
People
Programs
Performance
Facilities
Principal :
Ward : 1
Enrollment :
Address : 2020 10th St , N W
Zip Code :
Phone/Fax : 202-673-7311 202-673-6500
e-mail :
website :
Age Range :
Grade Range :
Mission Statement
It is our mission at John Quincy Adams Elementary School to provide a comprehensive education for our diverse and multiethnic population. It is an education that will enable all of its students to become academically proficient, possess self-esteem and demonstrate respect in our ever changing global society
Registration Information
Neighborhood School. out of boundary applications will be accepted by the school from January 29 through February 28,2000

top



top

BEST COPY AVAILABLE

Each school in this choice set has a school profile describing the school's programs, student body, and performance (that is, each alternative is now described by a large set of attributes—the other critical piece of information needed by to study choice behavior). Note that detailed information about each of these attributes is accessed by pointing and clicking on a tab that takes the parent to a page with more detailed information about a school in the choice set. So, similar to the traditional information board, parents gather information by clicking and pointing through sets of alternatives and attributes.

Eureka!—the Internet has been harnessed as a high tech version of a traditional research tool (you can imagine how proud we were of this leap). Below we use data generated by search patterns to explore parental decision making, but as we discuss next and as will be seen later in the empirical analysis in Part 3, what is a simple task in a controlled computer environment turns into a difficult problem on the Internet. There were two particularly vexing problems.

While keeping track of the movement of parents through the site (which schools did they visit? Which attributes did they click on? In what order?) was not difficult, recall that testing most behavioral decision theoretic models requires both the pattern of search *and* the time a subject spends on any piece of information. In a laboratory setting and using a traditional information board, time can be measured in microseconds. But on the Internet time spent looking at information is a function of parental attention *and* the speed at which information is delivered. This in turn is a function of the machine a person is using, the speed of their connection, and the time at which they are accessing the site. As we all know, on Monday at noon (one of the heaviest traffic periods on the Internet) the World Wide Web is the "World Wide Wait." But even Mondays at noon differ—some Mondays are worse than others. While we have recorded the time individuals click to start downloading a page and when they click to move to the next page, that is, we know how much time they spent on a given piece of information, we have no measure of how much of that time was waiting for the information to appear on their screen and how much was spent reading the information. Eventually, we will try to control for time of day using a series of dummy variables, but the crudity of our timing measure and the sophisticated demands of behavior decision models are out of sync—and the usefulness of this lovely research design was seriously compromised.

This problem was exacerbated by two other issues. In any experiment using information boards, the researcher can manipulate the values of attributes and structure the choice set to better

isolate the subject's utility function and to force the subject to engage in trade-offs that reveal preferences and information processing capacities. Obviously, in DCSchoolSearch.com we were dealing with a set of real schools, and the data cannot be manipulated to test different models of decision making. And finally the research design was undermined by the simple fact that in an experimental situation using an information board, the parent will make an artificial choice (on the board in Figure 2.1, they would push the "select a school" button and then be asked to choose the school they liked the most. This choice becomes part of the ways in which different models of decision are tested.)

But what is the "real world" counterpart? In DCSchoolSearch.com, we are clearly trying to improve the real choices of real people among real schools. We decided that the best way to do this was not to ask parents to "choose a school" while they were on the site (an artificial task), but rather to e-mail them afterwards to see if their propensity to choose and their preferences among schools was affected by the information they had viewed. We discovered that e-mail surveys of this sort were less productive than we thought.

E-Mail Surveys Are Limited—So Are Other Ways Of Getting People To Give You Information Online

One central theme in research into education and school choice is the distribution of attitudes and behaviors of parents of different educational, class, and ethnic backgrounds. And indeed in any telephone-based survey, a fairly extensive (and fairly standard) set of demographic questions about education level, income, marital status, racial identification, etc. that is routinely asked and used in subsequent analysis. We, of course, wanted similar types of information from parents using DCSchoolSearch.com. We had three mechanisms to get this information.

First, anyone wishing to use the site had to supply us with five pieces of information in order to access to the site. Using "pop-up" boxes, each user had to tell us (a) if he/she was a student, a parent, or "other" type of user; (b) his/her education level; (c) his/her frequency of Internet use; (d) from where he/she was signed on; and (e) his/her extent of voluntary activity in schools in the last year. As researchers, we wanted to make more information mandatory, but the more information you ask, the more likely is a visitor to exit the site.

Second, visitors were asked to fill out a more detailed on-line survey. In this survey, parents were asked to provide information about each of their children in the DC public schools, to evaluate the overall quality of the school, and to report on how well the school was performing on a variety

of indicators. Parents were also asked to report on how many different kinds of search activity they engaged in during the past year (for example, did they apply for an out-of-boundary transfer permit from the DCPS? Did they apply to a DC charter school or a private school? Did they move into a more desirable school's catchment area?).

Third, we asked visitors to give us their e-mail addresses. Increasingly, social scientists (and commercial polling firms) are moving away from telephone-based interviews to e-surveys (see for example http://survey.caltech.edu/). Given the rapidly increasing use of e-mail coupled with plummeting response rates from telephone polls, and given the cost advantage of e-mail surveys, this migration is not surprising. We were part of this "wave."

However our experience was salutary. Since a visitor could not get access to the site without answering the first five questions, "response rates" to these were 100 percent (of course, some people did leave the page without providing any information—and as is always the case with web sites, we had many more "hits" than we had actual users). And, as with any Internet-based instrument, we really have no idea about the accuracy of the data provided—it is well-known that people often take on different persona when they are on the Internet. Thus, we have no way of verifying that the answers given to these five questions were accurate (but then again neither do telephone-based surveys).

The object of using only five questions as the cost of entry was to "lure" users into the site, assuming that once they have made the initial investment of time and energy, they would be more likely to provide additional information. We discovered that this was by far too optimistic.

Of all the registered users, only a handful bothered to complete the online follow-up survey. We are not alone in finding abysmal response rates to site-based surveys—GreatSchools.net has also tried on-line surveys, and of the hundreds of thousands of hits they get, they too report that only a "couple dozen" completed surveys. We therefore had to rely more on an e-mail survey to get the necessary data. About 500 of the parents who visited our site gave us e-mail addresses and of those just over 150 responded to the e-survey. We present some analysis of these data in the next section of the paper, but we should warn readers that each step of the process—signing on to the Internet site, becoming a registered user, supplying an e-mail address, and responding to our e-survey—produces selection biases. Unfortunately, we do not believe that the social sciences have yet developed statistical methods adequate to feasibly identify and fix these biases—making any statistical analysis (including the ones we report below) problematic.

There May Be A Built-In Conflict Between Research And Action

Recall that DCSchoolSearch.com, like EPIC, is a collaborative effort between a university-based team and a set of community groups. Compared to EPIC, DCSchoolSearch.com is much more research-oriented and less formally tied to a large number of community groups. But there is a lesson from the operation of both these sites: if a researcher cannot get the level of funding that GreatSchools was able to obtain or if a researcher wants to provide more than the published information GreatSchools is based upon, then collaboration with local community-based groups is essential. These groups provide the legitimacy and the political support that can lead suspicious and often hostile school administrations to "open up," even if only marginally. But even with local political support from these community groups, data often remains elusive. DCSchoolSearch.com was never able to include all the information that it had hoped to provide in its database, but the unrelenting political pressure put on the DCPS by the 21st Century School Fund and its allies did ultimately unearth several critical pieces of data that an outside research team could never have identified. Moreover, local not-for-profits often have strong ties to neighborhood groups and local media, both of which are crucial for success.

However, there is a clear cost to these partnerships—the interests of a social scientist creating the Internet site as a research tool and the interests of not-for-profits in actually providing a service may conflict. In retrospect, the form of the conflict that emerged in DCSchoolSearch.com should have been anticipated—but the appropriate resolution is still not clear. Here is the issue: the very strength of Internet-based applications lies in their dynamic character—they can be changed easily. This dynamic character interacts with the difficulty of obtaining information that jointly threatens the validity of the Internet site as a research tool.

Consider the following example: we needed to get DCSchoolSearch.com open to the public in time for the "shopping season"—that is the time period during which parents are actively searching for alternative schools for their children and the time period in which parents need to request "out of boundary" permission from the DCPS, permission that is required to enroll a child in other than the neighborhood school. We also knew that if we didn't have a firm opening date, we would spend months and months making improvements, entering data, garnering political support, etc. As a result, when DCSchoolSearch.com was rolled out in November of 1999, we knew that the data base was incomplete, and we were not sure if we would be able to obtain some very important pieces of information about the schools.

Here then is the problem: as new data comes in and enters the database the site becomes more valuable as a community resource. But these changes affect the site as a research tool. The changing data changes the site as a "stimulus" that is prompting parental responses. Recall that, for researchers, the pattern of search and the time spent on each page are the data being generated by DCSchoolSearch.com that are central for testing theories of decision making. In other words, the site is the stimulus to which visitors are responding. But clearly entering new data fields changes the stimulus—and adding important new data can radically change the stimulus. As researchers, we wanted the stimulus to be held as constant as possible. However, our local partners wanted the data added as soon as it was located—because it was potentially important to the choices made by parents in the real world. We argued that the data could be entered later in order not to contaminate the experiment. Our partners argued that the data had to be entered earlier in order to affect choice. This produced a series of compromises that left no one particularly happy. As researchers we will ultimately need to "control" for different time periods before and after major changes in the database, but this is not a perfect solution.

Despite these problems, the DCSchoolSearch.com site has now been in service for one entire "shopping season" and we have collected data on who is using the site and how it is being used. We present some analysis of these patterns next.

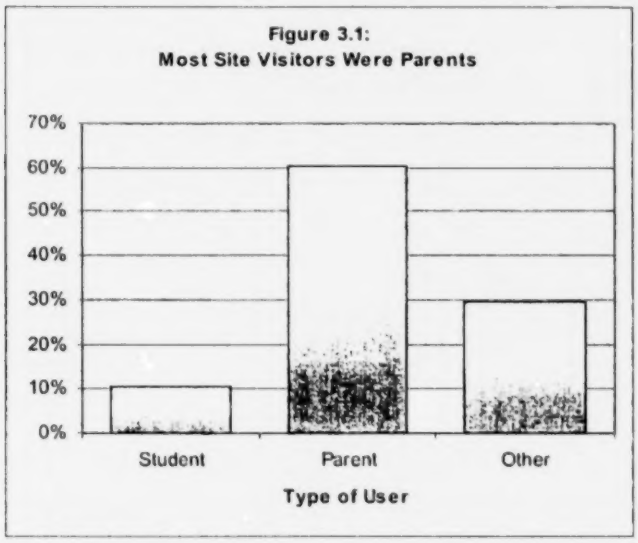
Part 3: What Have We Learned from DCSchoolSearch.com?

As we noted above, several realities of Internet-based social science research hampered our ability to empirically investigate some of the issues of judgment and decision making that remain central to school choice. Nevertheless, we were able to gather a great deal of data from both site usage monitoring and from our follow-up e-mail survey. In this section we explore these data, starting with basic statistics concerning who visited DCSchoolSearch.com, we then briefly discuss how even a small number of parents with more information can effect change in the schools, and finally we examine parental search patterns as a test of a theory of decision behavior.

Spanning the Digital Divide: Who Uses DCSchoolSearch?

Between November of 1999 and June of 2000, DCSchoolSearch.com had approximately 7900 "hits," or visits to the website. Of these, 1567 were identifiable as unique individuals (excluding researchers and persons contributing to the database), with the rest of the hits coming from repeat visits. Of the 1570 unique users, the majority, by far, were parents. Figure 3.1 shows the breakdown:

60% were parents, about 10% were current students, and close to 30% were in the "other" category, which includes DC school officials, curious city residents and non-affiliated education researchers.



The next two figures show that our attempts at crossing the digital divide were less than successful. Consider Figure 3.2, which plots the frequency of Internet use. Note that our visitors were already frequent Internet users—about 80% said that they used the Internet on a daily basis, and almost all the rest said that they used the Internet once or twice a week. But even more telling is the breakdown of users by education level. As evident in Figure 3.3, the modal education category of site visitors was graduate training! Combine this with the just slightly smaller percentage of respondents who reported having either some college or a college degree and the picture of our user population is clearly out-of-sync with the profile of parents whose children are in the DC schools.

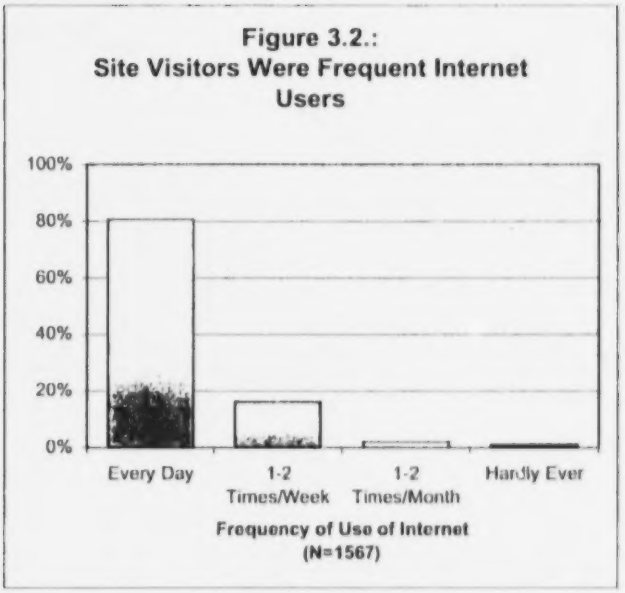


Figure 3.2.:
Site Visitors Were Frequent Internet Users
100%
80%
60%
40%
20%
0%
Every Day
1-2 Times/Week
1-2 Times/Month
Hardly Ever
Frequency of Use of Internet
(N=1567)

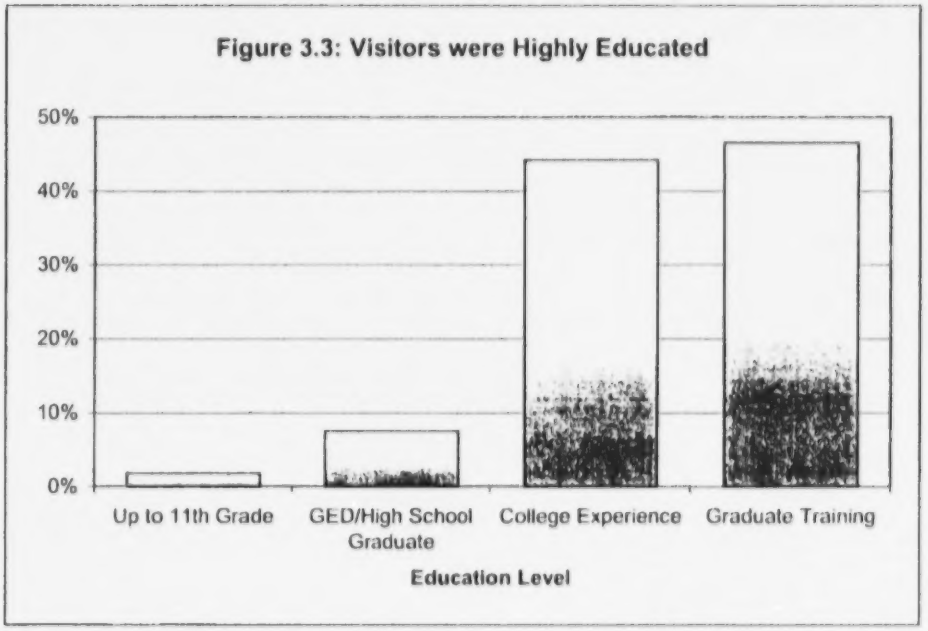


Figure 3.3: Visitors were Highly Educated
50%
40%
30%
20%
10%
0%
Up to 11th Grade
GED/High School Graduate
College Experience
Graduate Training
Education Level

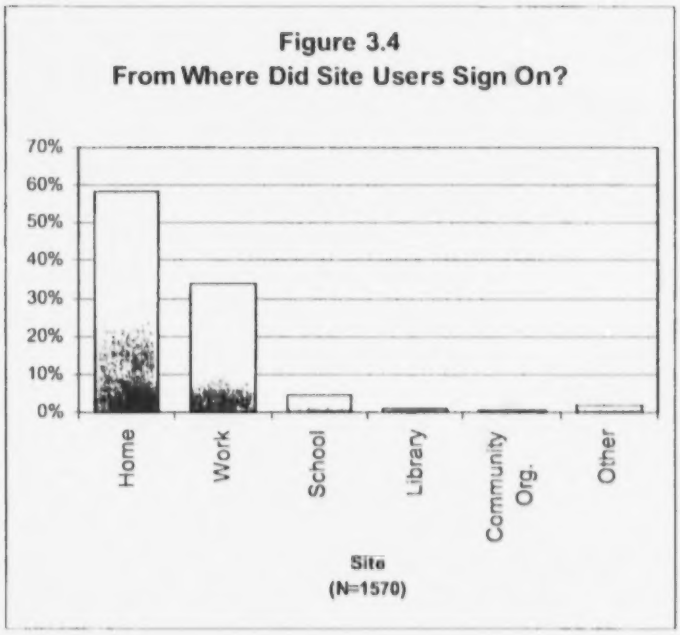


Figure 3.4 also confirms another factor contributing to the digital divide—over half of our visitors signed on from home and an additional third signed on from their workplace. In contrast, very few users signed on from a public place such as a library, school or community organization.

There are clear "entry barriers" that bar the use of the Internet. On one hand, there are the costs of purchasing and maintaining a home computer, of paying for an Internet service provider, and for having either a separate phone line or having an existing phone line tied up for long periods of time. On the other hand, people who are unemployed or work in places with no computer access are also denied a major route to the Internet and DCSchoolSearch.com. At the bottom line, our evidence is not salutary—despite the wealth of information provided on the site and despite our outreach efforts, we find little or no evidence that we bridged the digital divide.

Can Information Affect Change?

One goal of providing information to parents is to allow them to find schools that better fit the needs of their children. Many proponents of choice have also argued that such mobility can put pressure on schools to provide a more attractive set of alternatives and can indeed pressure school systems to become more efficient and more responsive to parental and student needs (see, e.g., Chubb and Moe 1990; Schneider et al. 2000). In Table 3.1, we see that over half of the parents who responded to our e-mail survey have actually changed their child's school during the past year and in

bottom panel of that table, we find that over half of these parents thought that the information they discovered about their different options *increased* their likelihood of changing their child's school in the future.

Table 3.1: Site Users as are Likely to be Active "Shoppers" for Schools

	% Agreeing
Did visitor change child's school in the last year?	58%
Did DCSchoolSearch.com increase the likelihood that visitor would change their child's school	52%

While we hardly want to claim that the decisions of such a small number of parents can leverage change in the DC public schools, we do want to argue that small numbers of well-informed parents actively engaged in search and actively choosing schools can make a difference. Here we rely on the concept of the "marginal consumer."

The "Average" Consumer versus the "Marginal" Consumer

Studies of competitive private markets show that only a subset of consumers gathers information about their purchases, that in many markets these consumers are the most careful shoppers, and that their actions generate: "competitive pressures that help keep prices reasonable for less-informed, non-searching consumers as well."(Rhoads 1985: 144). Schwartz and Wilde (1979: 638) argue that, "*the conventional analysis asks the wrong question.* Rather than asking whether an idealized individual is sufficiently informed to maximize his own utility, the appropriate normative inquiry is whether competition among firms [here, read schools] for *particular groups of searchers* is, in any given market, sufficient to generate optimal prices and terms for *all consumers* [emphasis added]." Thus, competitive markets require at least some consumers to be sufficiently informed so as to pressure producers to deliver services efficiently.

Empirical studies of private markets often find a group of consumers that search for more information than the average consumer. These consumers are more interested in and more "involved" with the product (Katona and Mueller 1955; Newman and Staelin 1972; Claxton et al. 1974; Slama and Williams 1990; Schwartz and Wilde 1979: 543). Two sets of studies have focused on the critical importance of these informed consumers. Thorelli and Engledow (1980) identify "Information Seekers" who comprise 10-20 percent of the population and help police the market by their comparative shopping. Second, Feick and Price 1987 label the upper third of information seekers "market mavens." Slama and Williams (1990) confirm that market mavens provide

comparative product information to others for many products and services. Schneider et al. (2000) extend this work from the private market to the local market for public goods, identifying a set of "marginal consumers" who are informed about schools and who exert pressure on local schools to be more efficient and more responsive (also see Teske et al. 1993).

That a small number of parents can influence a school district was made evident Mesa, Arizona, where the loss of 1,600 students to charter schools was enough to pressure the 70,000-student school district into making reforms (Toch 1998). Similar events occurred in Massachusetts, one of the most recent states to adopt inter-district choice (Armor and Peiser 1997). These developments in choice districts illustrate a fundamental point that we think has been overlooked in debates about choice. While proponents of choice, such as Chubb and Moe, and Sugarman and Coons, imply that the full competitive benefits of choice at the systemic level will be generated by high levels of information across *all* parents, the response of a smaller group of parents may be sufficient to produce these benefits.

Thus one of the goals of DCSchoolSearch was to increase the number of these informed consumers of education to affect change in the system. Thus while we believe that DCSchoolSearch did in fact contribute to increasing the number of "marginal consumers" and that the value added to the parents using the site was high, this high rate is applied to a small *base* of users, and the number of marginal consumers created or empowered by DCSchoolSearch falls short of a lever by which to affect change. However, we are now moving on to the other dimension of DCSchoolSearch.com: using the data it generated to explore parental decision making. We present some preliminary work below.

Using DCSchoolSearch Data to Explore Parental Decision Making

In the area of policy analysis, researchers have long been attracted to normative models of decision making, such as the familiar subjective expected utility maximization prevalent in economic literature. Accordingly, policy choice is evaluated by comparison to the normative ideal, and when policy success is dependent upon the aggregation of the decisions of many individuals, as in the case of school choice, the decision makers are generally presumed to be "rational actors." We believe that adopting this model is a fundamental mistake, since it sets the standard too high for most parents (and indeed for most actors) to meet. This is not an abstract point: the stakes of this argument are central to any reforms based on the expansion of school choice, since it is easy to show that most parents do not have sufficient information to meet the standards of "rational decision making." And comparing the failure of real parents to meet this standard, it is easy to dismiss calls for school

choice as built on a weak foundation (see, e.g., Ascher et al. 1996). Yet as we noted above, more sophisticated theories of choice do not require that all parents are informed—nor we argue do they require that parents conform to some impossibly high standard of decision making. In the next few paragraphs, we briefly present more reasonable standards for judging parents as decision makers, and, using DCSchoolSearch data, we show that the marginal consumer of education is likely to adhere to these standards.[7]

"Good" Decision Makers are Adaptive

Rather than following any specific set of decision rules, many behavioral decision theorists argue that individuals are adaptive in their decision making. For example, according to John Payne, people have a repertoire of strategies available for solving problems and they choose different strategies in response to different tasks (Payne 1976; also see Payne et al. 1993, March 1994). Ultimately, the repertoire of strategies from which the individual chooses has been acquired through some combination of training and experience with decision making,[8] and the choice of strategy from that repertoire is informed by a "meta-rational" cost/benefit analysis weighing accuracy against cognitive effort.

Similarly, Frisch and Clemen (1994) advance a framework for evaluating decision making that relies not on matching outcomes to the predictions of the expected utility model but rather on the observed quality of the decision process. Specifically, Frisch and Clemen identify three features of a "good" decision process: the decision maker must use a strategy that allows trade-offs between dimensions (a "compensatory rule"), they must identify the consequences of the decision ("thorough structuring"), and they must be concerned with the consequences of the choice ("consequentialism").

A reasonable application of Payne's strategy selection model to the Frisch and Clemen criteria results is the prediction that decision makers will use compensatory rules (comparing many dimensions among choices) when resources permit *and* when the consequences of the decision are sufficiently important. For us, merging these ideas with the theory of the marginal consumer is critical for understanding how parents select schools.

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[7] Here we are drawing on a large literature known as "behavioral decision theory." Because of space limitations, we are giving readers only a "taste" of the complexity of the arguments in that domain.

[8] A variety of studies using "microworlds," computer-simulated complex decision environments which strive to approximate real world decision problems, find strong evidence that experienced, expert decision makers, "…are more likely to spend more time in the phase of initial orientation and goal elaboration, to think in causal nets and not in causal chains, to consider possible side effects, to acquire more knowledge, to exhibit more concerted decision making behavior, and to achieve higher levels of performance." (Rigas and Brehmer 1999: 58)

To pursue this merger and then test the idea empirically, we first need to define the marginal consumer of education. Following Schneider et al. (2000), our definition of marginal consumers is based on actual choice behavior rather than on search behavior. We operationally define marginal consumers of education as parents who report that they have actively chosen a different school for their child than the default neighborhood school that their child would "normally" attend, either by actually transferring their child, or by applying to one or more schooling alternatives. With this behavioral definition in mind, we argue that marginal consumers of education should be more likely to use compensatory decision strategies than are other parents.

In their discussion of thorough structuring, Frisch and Clemen (1994) point out that the detailed analysis of options and outcomes is not only a function of resources, but also of the size and complexity of the option set. In the face of extreme complexity or myriad options, many researchers have argued that decision makers follow a two-stage strategy. Kahneman and Tversky (1979) distinguish between an "editing phase," during which decision makers structure the problem and attempt to eliminate options that seem to be dominated by other options, and an "evaluation stage." (On the importance of this two stage model also see Tversky 1972, Montgomery 1983, Beach 1990, and Svenson 1999.)

For consumers of education in districts with many schooling options, we believe that schools are a complex and multidimensional "good."[9] Accordingly, behavioral theories of decision making predict that some form of pre-choice editing will be used to reduce the selection set to a more manageable level. This leads to our second expectation: Marginal consumers of education are more likely to employ a two-stage strategy of decision making, wherein an initial editing phase is followed by a more compensatory comparison of remaining options.

We explore these two ideas using data from DCSchoolSearch.com.

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[9] Researchers have long argued that education is indeed such a good. In the literature on the choice of private over public schooling, dimensions such as relative or absolute academic performance (Buddin et al. 1998; Lankford and Wykoff 1992; Moe 2000; cf. Meier and Smith 1995), racial composition (Clotfelter 1976; Lankford et al. 1995), values (Schneider et al. 2000) and religious affiliation (Long and Toma 1988; Moe 2000) have all been found to be salient to choosing parents. Similarly, recent work on the motivations of parents using newer forms of option-demand school choice within the public system or at public expense have identified academic performance (Finn et al. 2000; Greene et al. 1998; Moe 2000; Schneider et al. 2000) and race (Henig 1994) as important factors. Additional dimensions on which parents in the public sector may evaluate schools include proximity to home, physical safety, the availability of extended-day programs and particular programmatic innovations (Teske et al. 2000).

Do Marginal Consumers of Education Engage in Compensatory Search?

We can distinguish empirically between compensatory and non-compensatory rule usage by tracking the information subjects seek when faced with a choice task. Using a classic information board in a laboratory, we would gather data on the total amount of information processed, as well as the amount of time spent viewing information and the variance of the proportion of time spent exploring each attribute and alternative. Unfortunately, given the "real-world" (or at least the real world of the Internet) basis of our experiment, we do not have reliable data for the time spent using the site: people move away from their computer, the Internet experiences periodic slowdowns in transmission (so-called latency or "lag"), some users have faster computer systems than others, etc. Thus our test of compensatory rule usage is limited to a "search per school" measure: a count of the total number of search actions taken by each user divided by the number schools examined.

Since a defining feature of a compensatory rule is that low values of one attribute of an alternative can be compensated by a high value on another attribute, a decision maker using such a rule must view much of the available information for all alternatives under consideration. This decision maker must then seek out more information per alternative than an individual using a non-compensatory decision strategy. Despite measurement limitations, we believe that our operational definition of compensatory rule usage captures its core characteristic.

After registering on the site, users are presented with a choice of browsing the entire list of schools which is presented in alphabetical order, or creating a more highly structured choice (essentially "editing" or "screening" the information) by either performing a predefined searches of the database or via an open-ended Boolean search that allows for "editing" by user-defined parameters. We operationally define the two-stage strategy as a parent who begins a visit to DCSchoolSearch by the selection of either the quick or advanced search option, followed by a compensatory search of at least 7.5 "tabs" (half of the fifteen available) of information per school examined after the choice set is returned. We argue that parents who begin their search by browsing through the list of schools, or who use a quick search but then fail to undertake a detailed, compensatory comparison of the unscreened results, are not employing a two-stage search strategy.[10]

In this case, the Internet as a research tool has an advantage over traditional information board methodology. Rather than choosing from among relatively few information options under laboratory conditions, our subjects face a bewildering array of facts and figures. The ready

[10] We experimented with a range of cut-offs above and below the "natural" cut point of 50% of the tabs. The results we report below are robust from about one-third to all of the available information.

availability of the data, as well as the pre-defined search options, allow for a relatively "frictionless" search, with none of the painstaking school visits and telephone calls required to shop for schools without such a database. Thus we are able to observe our subjects navigate complex, real-world data at their own pace.

To test our argument that marginal consumers of education compare education options in a more thorough, compensatory way, we treat the number of searches per school as count data and estimate the following model:

$$\text{search/school}_i \sim \text{Poisson}(\mu_i)$$
$$\mu_i = \exp(\beta_0 \text{Constant} + \beta_1 \text{Degree} + \beta_2 \text{Lag} + \beta_3 \text{Marginal Consumer} + \beta_4 \text{Moved} + u_i)$$

where:

- "Degree" is a dichotomous variable coded 1 if the subject has a college degree and 0 if not. We use this variable as a control variable since education is clearly a fundamental individual level factor that affects cognitive abilities, information search processes, and various behaviors relating to school choice.
- "Lag" is a scaled (1-5) subjective estimate of the amount of time the user waited for information to download to their computer. We use this as a variable to try to control for various technological factors that may affect the extent to which a person is willing to engage in extensive search on the Internet.
- "Marginal Consumer," a measurement of active "shopping," is a continuous variable created by factor analysis of six dichotomous school choice covariates: whether the parent actually changed their child's school in the past year and whether they applied for a public charter school, a private school, and out-of-boundary transfer, a special city-wide high school, or home schooled their child in the previous six months.[11]
- "Moved" refers to parents who changed their residence to secure a better education for their child. We treat this as separate from the Marginal Consumer effect because of the limitation of the website information to a single school district.

Table 3.2 shows that, ceteris paribus, marginal consumers do have a higher propensity to engage in more thorough searches of information than the average consumer.

[11] The Marginal Consumer variable was created by using the iterated principal factor method to analyze the correlation matrix of the variables. Factors then underwent varimax rotation and the logical factor with positive loading on all six variables was selected and scored to create the final continuous variable.

Table 3.2: Search Procedures of Marginal Consumers Are More Compensatory

Variable	*Coefficient*	*Standard Error*	*p-value*
Constant	2.22	.065	<.01
Degree	-.06	.06	.32
Lag	.03	.02	.27
Marginal Consumer	.10	.04	.01
Moved	.01	.11	.90

N = 136[12]
Log-likelihood = -549.38

What do the coefficients reported in Table 3.2 mean substantively? Using stochastic simulation (see King et al. 2000 or Tomz et al. 2000), we can estimate the effect of how the marginal consumer differs from the "average consumer." Table 3.3 shows the results of this simulation: the marginal consumer looks at over 10 pieces of information for each school in her choice set, which is 25% more pieces of information accessed by other parents.[13]

Table 3.3: Simulation Results for Compensatory Rule Model

	Mean Search/School	*Standard Deviation*
Sample	9.5	6.90
Average Consumer	8.0	.57
Marginal Consumer	10.5	.88

Do Marginal Consumers Engage in Two Stage Search?

To test whether-or-not marginal consumers are more likely to employ a two-stage search model, we estimated the following probit model using the same covariates as above:

$$Pr(Two\text{-}Stage\ Search) = \beta_0 Constant + \beta_1 Degree + \beta_2 Lag + \beta_3 Marginal\ Consumer + \beta_4 Moved + \varepsilon_i$$

As shown in Table 3.4, the Marginal Consumer is more likely to engage in a two stage decision process, while college degree, lag and moving are found to have no discernible effect on the probability of using a two-stage search.

[12] This analysis is based on only the set of parents who completed our e-mail survey and we recognize (and are exploring) the biases that this might introduce.
[13] The "Average Consumer" condition is a parent with a college degree who experienced minimal system lag did not move, and had the lowest in-sample value for the Marginal Consumer variable. In contrast, the "Marginal

Table 3.4: Marginal Consumers Are More Likely to Use a Two-Stage Search

Variable	Coefficient	Standard Error	*p*-value
Constant	-.43	.28	.12
Degree	-.20	.25	.42
Lag	-.11	.11	.30
Marginal Consumer	.52	.18	<.01
Moved	.12	.24	.81

N = 136

Log-Likelihood = -67.44

Note: Figures in column two are unstandardized probit coefficients. Search method is coded 1 for two-stage and 0 for other.

As above, we use simulation techniques to illustrate the impact of changing schools on the predicted probability of using a two-stage model. Our results are presented in Table 3.5, which show that over half of the marginal consumers use a two stage decision process compared to only 10% of average consumers.

Table 3.5: Simulation Results for Two-Stage Search Model

	Probability of Using Two-Stage Search	Standard Deviation
Sample	.24	.03
Average Consumer	.10	.06
Marginal Consumer	.54	.13

We believe that these results, while preliminary, contribute to understanding how active consumers of education choose schools; they help us set reasonable standards by which we judge the ability of parents to search for schools; and they can help other researchers wishing to use the Internet as a tool for testing hypotheses from decision theory.

Part 4: Using Modern Information Technologies To Create Stronger Schools and Stronger Communities

Despite these benefits, we still must conclude that DCSchoolSearch failed to live up to our expectations as tool that could actually create more marginal consumers. The experience of creating,

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Consumer" condition is a parent with a college degree, experiencing minimal computer lag, with the highest in-

administering and extracting data from the site has, however, taught us a great deal about the promise and the pitfalls of electronic technology applied to education issues. In the final section of this paper, we draw on these lessons to discuss the future relationship between school-based Internet sites, schools and parents, and try to discuss how the power of the Internet can be better tapped to improve schools.

The fundamental lesson we draw from our own experience and that of other school-based sites is that current efforts to bridge the digital divide using the Internet to dispense school information have not yet fulfilled the goals of their creators. Perhaps most importantly, despite the clear importance of the substantive information they are presenting, there is no evidence that these sites have bridged the digital divide.

While this is discouraging, we do not take this to mean that we should stop seeking to use the Internet as an avenue by which to improve schools. Rather, we argue that at least in the short run, more must be done to bring the Internet to a wider range of parents. Indeed, we argue that existing sites are *too timid* to tap the full potential of the Internet as a means of changing the relationship between parents and schools. Indeed, we argue that more intimate contact between low SES parents, researchers, and community groups is essential to tap the potential of the Internet as a force for change. However, success will require changes in how we use the Internet to build better schools.

From Consumers to Citizens: A New Image for the Internet

Just as the existing school-based Internet sites are built on a key assumption—that informed parents can make better choices—we believe that the next generation of Internet sites must be built on two different assumptions. The first we believe is uncontroversial:

- the active participation of parents in the working of the schools is necessary to create effective schools in which more learning occurs.

It is the second assumption that needs to be more fully explored:

- modern IT can increase the involvement of parents in their school community and create more vibrant school communities which will lead to better schools.

By adopting these two assumptions, we are in effect shifting the philosophy underlying present Internet sites away from *parents as consumers* of education to *parents as citizens* actively involved in the ongoing educational processes affecting the quality of the schools and the education of their

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sample value for the Marginal Consumer variable.

children. Just as this is a radical redefinition of the role of parents, this change in perspective requires a radical change in the way in which we view the way in which the Internet and related technologies are employed.

As we elaborate this argument, we focus on schools, but ultimately we make a large leap—we argue that by building parental deliberative skills and participation focused on the schools, we can also improve a broader range of democratic practices. To use somewhat different words, we argue that we can harness modern IT to build social capital that can be tapped not only by the schools but also by the broader community.

We recognize that many analysts are skeptical of the impact that new electronic communications can have on democratic practices and argue that these changes will not transform the nature of interaction among parents and between parents and their schools. Indeed, some social scientists have argued that the use of the Internet and related technologies fosters social isolation and anomie (e.g. Nie 2000). But there are arguments to the contrary. For example, Robert Putnam in his new book, *Bowling Alone*, argues that the growth of the Internet is one of the few exceptions to the general decline in civic engagement he has spent the last decade documenting and he argues that it is "hard to imagine solving our contemporary civic dilemmas without computer-mediated communication." (Putnam 2000, 180)

Supporting Putnam's speculation, a recent study by the Pew Internet and American Life Project found that Internet users had stronger networks and the more time respondents reported spending on line, the more likely they were to report having a social network to which they could turn for support and information. According to this study, more than half of the Internet users surveyed found that e-mail was actually strengthening their social ties to friends and family. In addition, and this is critical, Internet users also had substantially *more* physical contact with other people.

Thus, both Putnam's intuition and the empirical data reported by the Pew Internet project support our contention that time spent discussing schools electronically with other parents can create stronger communities and that new technologies, if properly employed, can help create what Putnam has described as a "virtuous circle"—a self-reinforcing process in which informed and supportive discussion among parents who share an interest in the schools can lead to action that produces better schools, and that these successes enhance parent confidence and willingness to engage in further discussion.

Schools, we believe, provide a near-perfect venue in which to build the links between electronic deliberation, action, and citizenship. The importance of schools to the lives and well being of children provides parents with a natural incentive to discuss the daily events occurring in their schools. In addition, parents can understand most school and educational practices, allowing them to engage in serious deliberation about them. And better-informed parental behavior and involvement with the schools can affect school programs and the quality of their children's education. In short, schools are a domain in which the virtuous circle can take root—informed discussion can lead to behavior that can produce positive results that then enhance the willingness to engage in further discussions.

But how, exactly, does enhanced communication lead to stronger communities? We believe that there is a path to stronger communities that runs through modern IT, and that this path is built on technology as a *supplement* to traditional social engagement. In other words, we believe that modern IT when properly used will not replace face-to-face communication, but will augment it.[14]

One of the most important theoretical foundations for this argument is the concept of social capital. We believe that there are at least two fundamental ways by which IT can be harnessed to build social capital and, by extension, stronger communities:

- IT can foster interpersonal communications, build new forms of networks, and create new forms of electronic deliberation. By encouraging and enhancing parent participation in school and community events, these activities increase the stock of social capital.
- When appropriately employed, modern IT can build a stronger foundation for communities by increasing levels of information and by encouraging parents to engage in reasoned discourse. This in turn improves the deliberative quality of social interaction.

We discuss both of these ideas below and show how these ideas are particularly applicable to schools, but first we turn need better to describe how these paths are related to the concept of social capital.

[14] This belief is supported by a growing body of research in the fields of communication and organizational sociology that demonstrates the differences between the two types of communication. See, for example, Bordia (1997), Flaherty et al. (1998) and Etzioni and Etzioni (1999).

Building Social Capital

Social capital has become a common concept in the literature on political participation, education policy, democratic theory, and social networking. We know that the concept of social capital has attracted a great deal of attention—and we also know that this attention has often confused rather than clarified the concept. Despite the intensity of the ongoing debates, for us there are three aspects of social capital that mesh with our concern for building stronger communities using modern IT.

- First, as a concept, social capital is important because it is concerned with the barriers to social exchange. We believe that modern information technologies can lower these barriers.
- Second, most analysts agree that participation is a central part of any working definition of social capital. We believe that electronic deliberation can enhance traditional forms of participation and help to open up new channels.
- Third, we believe that governmental institutions, and particularly the schools, can nurture social capital by providing incentives to facilitate its formation or by reducing the costs impeding its creation. We believe that while government can help create and nurture social capital, society does not need to accept a broad or intrusive role for government—rather government can help to harness the powers of modern IT and create an infrastructure that makes informed participation cheaper and easier, and by so doing, help bridge the digital divide.

We begin with a discussion of social capital and then show how this concept links to our concern for harnessing the power of modern IT for building strong schools and strong communities.

Two Theories of Social Capital: James Coleman and Robert Putnam

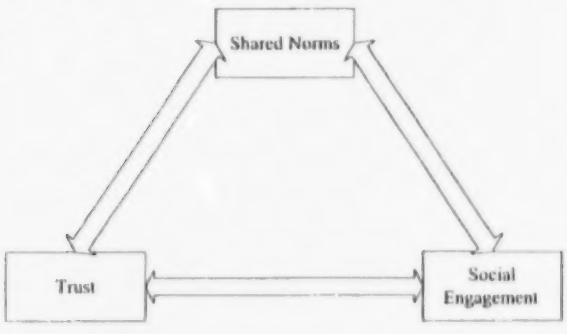
Sociologist James Coleman (Coleman 1988; 1990) is generally credited with more precisely specifying the concept of social capital and introducing it into common academic usage. While social capital has subsequently ballooned into a "catch-all" phrase in much of the social science literature, Coleman's goal in exploring the concept was rooted in a very specific problem: how and why do rational actors exchange social "goods" absent a negotiable medium of exchange? Coleman recognized that people in any social setting face a problem: social "goods," such as attention or non-pecuniary favors, cannot be converted into any meaningful sort of medium of exchange. Therefore

even though exchange in a social system might make all parties better off, such an exchange is an unlikely occurrence except in the case of a "coincidence of wants" for all actors in the system.

Coleman's solution to this dilemma was social capital: "Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible." (Coleman 1988: S98). Coleman argues that social capital provides the solution through two ways: by expanding the number of ways in which actors interact and by the inclusion of additional actors who may make exchange feasible.[15] In a manifestation of the virtuous circle, social capital is in turn formed through a combination of *multiple interactions* between the same set of individuals in a social system and the addition of new actors to the system.

Other researchers since Coleman, especially Robert Putnam, have modified the concept of social capital, most notably by adding a normative dimension to the concept. In contrast to Coleman's limited and value-neutral conception of social capital, Putnam hypothesizes that civic engagement (or membership in groups) both depends upon and builds trust and social skills which in turn lead to increased political efficacy and strong citizenship.[16] Social capital for Putnam thus includes not only the dense web of social interaction that Coleman describes, but also the broader norms and "civic virtues" which facilitate these multiple interactions.

Figure 4.1: Putnam's Virtuous Circle as Social Capital



Central to Putnam's conception of social capital is the idea of the virtuous circle, in which norms of interpersonal trust and communitarian ideals interact with civic engagement to create a self-reinforcing system (Putnam 1993). Figure 4.1 is an illustration of Putnam's virtuous circle that both produces and defines social capital.

[15] Another possibility is that actors in the closed system can change their preferences to adjust to the realities of exchangeable "goods." While an important line of argument, this shift in preferences is not directly relevant to our discussion here.

[16] Putnam's conception of social capital has been influential across the social sciences. For example, Schneider, et al. (1997, 2000) acknowledge the difference between the Coleman and Putnam conceptions, but choose to utilize the latter in their examination of how the ability to choose schools affects the formation of social capital. Brehm and Rahn (1997), while briefly referring to problems of collective action, implicitly use Putnam's formulation of social capital as a theoretical foundation upon which to build their structural model of its formation and maintenance. Indeed, virtually all other researchers have adopted Putnam's definition (e.g. Henig 1994, Lake and Huckfeldt 1998, Campbell 2000, Greely 1997, cf. Levi 1996 and Jackman and Miller 1998).

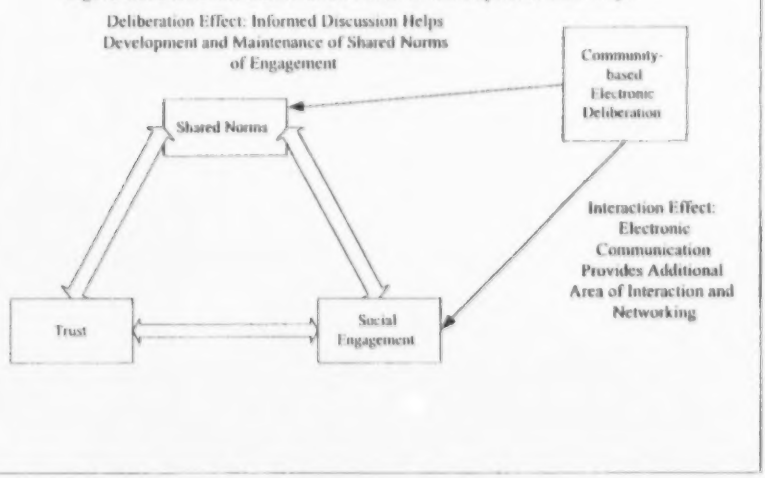
For Putnam, this virtuous circle and the resulting flow of social capital forms the foundation of a strong community. But Putnam and other analysts have asserted that this foundation may be crumbling. In his influential essay, "Bowling Alone: America's Declining Social Capital," Putnam argues that Americans are no longer joining the types of organizations that promote civic virtue and engaged citizenship (Putnam 1995; Putnam 2000). Nevertheless many social scientists, including us, believe that Putnam may be looking backward rather than forward in his definition of civic engagement.

Using Electronic Communications to Build Social Capital

Many critics of Putnam argue that his work is focused on "older," more traditional, forms of social engagement and neglects newer forms of community involvement. For example, some social scientists have criticized Putnam for concentrating on declining participation in bowling leagues (an "old-fashioned" sport) and Rotary Clubs while neglecting the rise in soccer leagues and "12 step" self-help groups (see, e.g., Hall and Lindholm 1999). More germane for us, Putnam focuses on traditional means of participation while largely neglecting the rise of new forms of community, especially the rapid proliferation of "virtual" communities that tie individuals together via e-mail, chat rooms, forums, and other electronic links. Some theorists argue that these modern information tools can create strong links between individuals and create strong communities that fall outside Putnam's scrutiny (Barber 1997; Grossman 1995; Rheingold 1993). Not surprisingly, we too take this position.

In Figure 4.2, we present our version of the virtuous circle in which an increase in interaction and networking and an increase in the deliberative quality of interpersonal interactions based on modern IT can help build social capital. This more expansive model leads to several links between information technology, social capital, and the schools.

Figure 4.2: Electronic Deliberation Builds Social Capital in Two Ways


Deliberation Effect: Informed Discussion Helps Development and Maintenance of Shared Norms of Engagement
Community-based Electronic Deliberation
Shared Norms
Interaction Effect: Electronic Communication Provides Additional Area of Interaction and Networking
Trust
Social Engagement

As Figure 4.2 illustrates, one way in which new forms of

electronic communication can facilitate the formation of social capital involves the direct effect of IT on social engagement. In the narrowest sense of this idea, electronic organizations or discussion groups on *any* topic can provide a social sphere where people can meet and interact, and this engagement is central to almost every definition of social capital. As we will demonstrate below, there is an intimate link between schools and networks that can be strengthened by IT.

While it may seem as though we are proselytizing for a totally electronic world, we in fact believe that in order for electronically-based networks to meaningfully contribute to the formation of social capital in real physical communities, participants must interact with each other in traditional ways as well. While it is possible to imagine completely "virtual" communities in which members belong to numerous completely electronic organizations thus creating a web of interaction that serves as the cornerstone of social capital,[17] such a world would probably not be sufficient to build large stocks of social capital. As Putnam notes:

> Face-to-face networks tend to be dense and bounded, whereas computer-mediated communication networks tend to be sparse and unbounded. Anonymity and fluidity in the virtual world encourage "easy in, easy out," "drive-by" relationships. That very casualness is the appeal of computer-mediated communication for some denizens of cyberspace, but it discourages the creation of social capital. If entry and exit are too easy, commitment, trustworthiness and reciprocity will not develop. (Putnam 2000: 177).

Despite these caveats, the revolution in electronic communication holds a great deal of promise for building social capital. But we must bear in mind that the important issue is ultimately how the Internet and related IT can strengthen the physical communities that real citizens inhabit. For example, we believe that in a strong school-based community, grass roots face-to-face participation in organizations such as the PTA would be supplemented by a school-based electronic meeting space, where parents could talk to each other on a regular basis.

The potential value-added of electronic communications becomes evident when we look at how modern IT can transform networks in which parents gather and exchange information about schools.

The Importance of Networks

While much of the research on networks is often abstract and centered on issues of general political participation, empirical work has documented that networks are important for the dissemination of information about schools and for linking parents together. Indeed, one of the

most important ways that parents find out about schools is talking with friends and neighbors (Wilson 1992, Glenn, McLaughlin, and Salganik 1993, Beales and Wahl 1995, Heise et al. 1995; Schneider et al. 2000). But while research demonstrates that networks are important to parental behavior, Schneider et al. (1997) show that many low-income parents, especially in the inner cities, are embedded in such poor quality networks that they are effectively "networks to nowhere."

This is where electronic communications can be critical—modern IT can potentially help parents create larger networks and IT can link many more parents to new sources of information that are essential for finding higher quality information about the schools and other important goods and services (Bonchek 1997). We recognize, of course, that class and racial patterns will still define interactions, but given the fluid and expansive nature of interactions on the net, some of these barriers might be eroded. Thus we believe that IT can be harnessed to *add value* to improve the flow of information that parents have and link them to larger and better quality networks of discussion.

There is a second way in which electronic communication can help build social capital: by increasing the deliberative quality of discussion. Again as Figure 4.2 illustrates, we argue that informed deliberation directly influences the "virtuous circle," by altering and strengthening the shared norms of individuals and, by extension, their community and, ultimately, the broader democratic polity.

Democratic Deliberation: The Importance of Reasoned Discourse

Theorists have long argued that democracy must be built upon the foundation of an informed and involved populace (Yankelovich 1991). We believe that new communication tools can help build reasoned political discourse about the schools and hopefully broader political and social issues. Ideally, reasoned discourse and deliberative democracy can transform the contention and conflict inherent in most contemporary politics into a cooperative orientation, where citizens seek to understand issues more deeply and enter into reciprocal positive relationships, building trust and respect.

James Fishkin is perhaps the most visible proponent of this idea. In his 1995 book, *The Voice of the People,* he argues that furthering our most fundamental democratic values,

> ...requires conditions that reknit the citizenry to the political process: that encourage thoughtful discussion, mutual respect, active participation, and an openness of the process to all groups and strata. We must create public

[17] See Turkle (1995) for a description of MUD's and other similar types of completely electronic community.

> spaces that effectively motivate citizens to become a 'public' where realization of these values is possible (Fishkin 1995: 143).

We should note that while Fishkin's work is based on face-to-face encounters, he recognizes that efforts to create deliberative democracy could be enhanced by electronic technology. Indeed, while we are concerned with today's information technology, Fishkin describes "America's Meeting of the Air" as an early example of using then-modern information technologies (here, radio) as a tool to facilitate the spread information and encourage democratic participation.[18] But clearly the interactive capacity of radio is limited compared to modern information technologies.

In the next few pages we review the benefits and costs of deliberative democracy and we review several projects that have tried to build deliberation relying on face-to-face communications. We then discuss some of the electronic approaches that have been launched to reach the goal of stronger democracy.

The Benefits and Costs of Deliberative Democracy

Existing studies show that there are at least three types of benefits that flow from deliberative democracy. The first two are essentially attitudinal: deliberation should make citizens more aware of and more engaged in the policy issue at hand and deliberation should increase levels of knowledge about the issue. The third type of benefit is behavioral: deliberation should foster participation and continued involvement in the policy process (McDonnell and Weatherford 1999).

Indeed, there are a number of quasi-experimental studies that show that taking part in active deliberation on policy issues does lead to greater interest and knowledge about that policy (see Fishkin's (1995) work on deliberative polling, Cook's study of Americans Discuss Social Security (1999) and McDonnell and Weatherford's (1999) work on schools). But the link between deliberative democracy and actual behavioral change is for us the most exciting possibility but one that has not been well documented. McDonnell and Weatherford's work begins to investigate this link—and we believe that it is not coincidental that the policy domain that they explore is education.[19]

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[18] America's Meeting of the Air ran for close to 20 years and pioneered the use of many of the techniques that are now common to electronic town meetings. These included the use of "ordinary" citizens to pose questions to elites, telephone call-in from cities across the nation, and balanced debates between opposing elites. According to Fishkin, the inventor of the program, George V. Denny, had the insight that "the new electronic medium (the radio) could be used to constructively engage citizens in thinking about public issues. He aimed at the stimulation of citizen deliberation through an organized conjunction of arguments and counterarguments." (Fishkin 1995, 136)

[19] Fishkin cites a study of how community organizations can create social capital using the Texas Industrial Areas Foundation project in the Morningside Middle School in Fort Worth. Through intense face-to-face meetings and increased parental involvement in the schools, test scores increased, violent crimes decreased, and the community

Similar to our criticism of existing school-based Internet sites, McDonnell and Weatherford argue that the forums set up by Fishkin and observed by Cook are focused on disseminating information and not on encouraging action: in these approaches there is the expectation that change will occur, but both are designed to change the level of information and beliefs that individuals hold. In addition, in the policy domains presented in the studies reported by Cook and Fishkin, the kinds of behavior that citizens can engage in are remote and unfamiliar (writing a letter to a member of Congress, registering an opinion on an issue position).[20] Moreover, people engaging in that behavior get no immediate feedback on the effects of their behavior—for example, it is very hard, if not impossible, to connect the fact that one has written a letter to a Senator about Social Security with the Senator's subsequent vote on the issue or any other policy changes enacted in the Congress (not to mention the fact that the time lag between writing the letter and any legislation may be very long and the writer may never even know that any legislation was enacted).

Equally important, the behaviors that were monitored were at the individual, not the collective, level, so that the behaviors at the center of existing deliberative democracy forums are *isolated* acts, not part of the social fabric of communities and collective action. McDonnell and Weatherford rightly argue that while existing studies document some positive attitudinal changes and increases in knowledge, their contribution to our understanding of policy-relevant behavior is limited.

Using Deliberative Democracy to "Reconnect" Communities and Schools

McDonnell and Weatherford try to sidestep these limits by focusing on the power of deliberative democracy to link schools and communities. In contrast to other deliberative democracy forums which were unrelated to local government or local policy making bodies, the reconnecting project was supported by local school boards in South Carolina and the project was charged with creating a blueprint for civic action for the local schools governed by these boards. While the study design is flawed (e.g., the self-selection of participants, the absence of control groups), it nonetheless provides evidence that deliberative democracy can lead to collective action and enhanced participation in school communities.

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more broadly became energized by the revitalization of the school. The success in one domain (education) spilled over to other domains.

[20] For example, using an increase in letter writing to members of Congress following a forum on social security is simply not a good measure of behavioral change. The expected benefits of doing so are too low in relationship to costs and the act itself is removed from the everyday interests and skills of most citizens.

Given the theoretical and practical stakes underlying the study of deliberative democracy, we are surprised by the paucity of strong empirical studies. But from the studies that have been done we believe that the evidence—albeit limited—shows that deliberative democracy can produce benefits for participants. According to these studies, participants become more knowledgeable and more involved in a policy domain. And in the South Carolina study, there is evidence that deliberative democracy can actually benefit providers of education, by getting them to reshape their services and standard operating procedures to reflect better the interests of their constituents.

These benefits, however, have been documented mostly in controlled settings—only the South Carolina study comes close to a "real world" venue. Nevertheless, we believe that there is enough evidence that benefits are likely to flow from deliberation—which leaves the question of costs.

Many of the deliberative democracy projects are simply too logistically difficult and too costly to "scale up" and diffuse to other policy domains or geographical locations. What is needed is a relatively inexpensive way of creating ongoing deliberative forums—and here we believe that modern information technologies provide the means. However, existing efforts to tap that power have not yet proven effective. In the next few pages, we review some of these efforts.

Efforts to Enhance Electronic Democracy

Perhaps the most common approach to electronic democracy is through the creation of community computer networks that have existed since the 1970's (Beamish 1995; Schuler 1997). In another common approach, in many locales experimenters have used a variety of audiovisual technology to facilitate "electronic town meetings" of various scales (Slaton and Becker 1998). The possibilities of these innovations have exploded as the Internet and its related technologies have become increasingly available to ordinary citizens (Best et al. 1999; Hoffman and Novak 1999; Nie 2000). The Internet, with its ever-increasing quantity of information, as well as its ability to connect users point-to-point and interactively, has indeed been cited as a panacea for democratic ills (Grossman 1995; Rheingold 1993).

But in this enthusiastic embrace of the Internet as a medium to foster democratic discourse, its proponents have often overlooked its faults. The lack of restraint induced by anonymity and the detached nature of electronic communication often leads to uncivil and non-deliberative debate (Benson 1996). Indeed, electronic forums may actually attract disaffected individuals with a deep

distrust of government and immutable cynicism about the democratic endeavor, which can poison the dialogue of other citizens (Johnson and Kaye 1998).[21]

Despite these criticisms, many believe that the Internet is a powerful tool for the promotion of deliberative democracy and redefining the relationship between citizens and public services and have sought to develop specific technologies to encourage and support "electronically enhanced democracy."

While some of these projects seem potentially promising (Beamish 1995; Exchange 1998), most suffer from a lack of focus on a specific issue area and do not attract an associated public involved with the issue in an ongoing and meaningful way. But more importantly, these sites also provide little means for ordinary citizens to participate in discussion or decision-making (Hale et al. 1999) One recent study of municipal websites concludes that:

> ...[T]he Internet is rarely used in ways that can reasonably be thought to lead to incremental reform, let alone democratic renewal. In general, information provision is patchy and the level of interactivity supported does not improve significantly on the telephone. Moreover, when we examined more fundamental uses of technology that foster political communication, we found that the current city use of web technology does little, if anything, to foster this type of democratic revitalization. (Hale et al. 1999: 115)

In summary, many of the extant deliberative democracy projects are marred by the following characteristics. They are focused on :

- attitudes and not behavior;
- policy domains that are not easily understood or manipulated by the action of individual citizens or of small groups of citizens working together;
- "pushing information" rather than encouraging action.

Thus existing models using the Internet have not yet tapped its interactive nature, and thus fail to test more fully the ability of this new technology to create stronger ties between citizens and to lay the foundation for stronger communities. What is needed to make deliberative democracy more effective is a collective action component that allows citizens to work together to achieve concrete policy goals.

So far, we have identified many failings in existing efforts to harness IT to build stronger communities. In the concluding sections of this paper, we identify the building blocks for successful interventions.

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[21] For a deeper examination of the risks to democracy from the social structure implied by high technology systems,

Building Sites that Work

While much work must still be done to identify the most effective way of building deliberative democracy using modern IT, we believe that we can begin by identifying the design principals and rules that must be incorporated to maximize the likelihood that these new approaches will work. Of equal importance, we believe that schools meet every one of these criteria, making them an ideal venue in which to explore the ties between IT and better public policies. We believe that there are at least six principles that must be built into the next generation of Internet sites.

1. *Debate must be local.* Meaningful deliberative discussion that leads to citizen engagement and the formation of social capital must begin at the grassroots level. Electronic democracy must be locally based and maintain a face-to-face component; that is, the contribution of computer networks to democratic discourse is their ability to add to, not replace, physical interpersonal communication.

2. *Debate must be relevant.* Credible democratic debate cannot be based upon the empty issues and political posturing so characteristic of the national political parties nor on the remote and abstract concerns of the technological elite. Rather, discussion must be about issues that ordinary people recognize as an important part of their daily lives. We believe that the education of a community's children is possibly *the* strongest such issue upon which to build meaningful civic deliberation.

3. *Debate must be moderated.* Unbiased, impartial moderation of electronic debate is essential for the preservation of civility, something all-too-often lacking in spontaneous Internet discussion. Furthermore, studies of "electronic town meetings" have demonstrated conclusively that lack of moderation and structure can lead to the domination of debate by a small set of participants, leading to further alienation and withdrawal from discourse.

4. *Debate must be accessible.* Electronic deliberation must also be freely available to all citizens, regardless of socioeconomic status or facility with information technology. The experiences of several community networks around the country demonstrate that this goal, although challenging, may be partly attainable through a variety of outreach and training strategies. Underlying issues of technological infrastructure, however, may require government intervention.

5. *Debate must be credible.* While many previous studies of deliberative democracy have demonstrated that debate can increase knowledge and improve the attitudes of participants, we believe that debate must ultimately be linked to possible actions and desired policy outcomes. We

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see Winner (1986). Also see Noveck (1999) and Rheingold (1993).

believe that the best debates are built around the idea that dialogue will lead to collective action and the amelioration of a problem.

6. *Debate membership must be limited.* Most online groups have only weak control over their membership and many founding members feel a distinct sense of loss as membership expands and they lose control over their "corner" of cyberspace. Moreover, since exit is so cheap, Galston (Galston 1999.) argues that exit will be the predominant mode of response to dissatisfaction. A large electronic community thus experiences a constant "churning" of participants, with little continuity of debate. For us, logical limits to membership consist of geographical or social/organizational requirements. In the case of schools, for example, participation in a deliberative forum could be limited to parents of students in a particular school, or to a school district, depending on the specific objectives of the deliberation.

Judging the Success of Internet Communities

Just as there are design principals that must be followed to make the next generation of Internet sites "work," we believe that there are criteria that can be identified to judge the success of the resulting communities. We begin with three criteria that Galston (1999) proposes for judging the strength of Internet communities and their role as training grounds for democratic practices.

1. Are Norms Shared?

Galston argues that online groups can produce complex systems of internalized norms, which emerge in response to the need for promoting shared purposes, safeguarding the quality of group discussion, and managing scarce resources (e.g., time, access) and that these norms help define functioning healthy communities. (Also see Boczkowski 1999, Hill and Hughes 1997.)

2. Do Electronic Communities Foster Respect and Tolerance?

As we discussed above, electronic communication is often regarded as having several flaws vis-à-vis face-to-face interaction, including a marked decrease in civility of exchange (Benson 1996), the use of alternate personae (Turkle 1995), and the lack of non-verbal cues such as body language (Flaherty et al. 1998). A successful site will be structured to overcome these impediments and allow the creation of a climate of respect and tolerance among participants.

3. Do Electronic Communities Foster a Sense of Mutual Obligation?

Galston argues that an essential criterion for judging the success and strength of any community is its ability to create and sustain strong norms of participation and involvement.

While Galston's list is a good starting point, we think several additional criteria must be used to judge the effectiveness of the next generation of school-based Internet sites.

4. Do Electronic Communities Increase Knowledge About Schools?

Knowledge is important because markets require information to function well—but empirical research shows that parents have very low levels of information. This issue is increasingly important given the rapid diffusion of school choice. Critics of choice argue that education is a complex good, difficult to describe in a way that people understand, and that less-educated parents (who can probably benefit most from any system of expanded choice) are the least able to access and analyze information. Seizing on this disjuncture of theory and reality, critics argue that, given the lack of good information among "parent/consumers," the success of choice reforms is unlikely (see, for example, Public Agenda 1999; Bridge 1978; Ascher 1996). So a critical criterion to assess the efficacy of the next generation of web sites is the extent to which parents become more knowledgeable about the schools.

5. Do Electronic Communities Foster Positive Attitudes Toward the Schools?

Although less important to us than changes in knowledge, social and political psychologists have long focused on the importance of attitudes for understanding a diverse range of cognitive and behavioral phenomena (e.g., Barent and Krosnick 1995; McGuire 1985; Petty and Wegener 1998). Attitudes can be important to the assimilation of information, through psychological processes such as "motivated reasoning." Additionally, research indicates that a larger amount of knowledge or information about a subject increases the congruence between attitudes and behavior (Davison et al. 1985). Thus we propose the following criterion for judging the effects of new school-based web sites: Do parents accessing an Internet site focused on the schools develop attitudes more supportive of their schools?

But for us behavior matters the most—and it is ultimately identifying changes in behavior that provide the most important criterion for judging the effects of any new Internet site. We propose that in addition to Galston's concern for mutual obligation other behavioral changes should be evaluated.

6. Do Electronic Communities Build Social Capital?

The literature on social capital generally focuses on such abstract ideas as trust in government and civic engagement and attempts to measure them using national survey data (e.g. Brehm and Rahn 1997). We believe that social capital must be measured at the individual level by observing changes in the amount of direct citizen participation in school affairs (e.g., joining the PTA, volunteering at the local school, attending debates on important issues). Thus one question to

consider in judging the effects of Internet sites is the following: Do parents using the site participate more in school-based activities that build social capital?

7. Do Electronic Communities Increase the Quality of Parent Networks?

Above we discussed the importance of networks in the dissemination of information about the schools and in creating social capital. Thus we propose the following test of new Internet sites: how effective have sites been in linking parents to larger networks that include a wider range of discussants, especially discussants who have expertise on school policy?

Note that all of these above criteria are centered on parents either individually or collectively. But ultimately we are proposing to harness the power of the Internet for a very concrete goal:

8. Do Electronic Communities Improve School Quality?

Thus we pose the following question as perhaps the most important criterion for judging the next generation of Internet sites: is there any evidence that harnessing modern IT has actually led to better schools and a higher quality education for students?

Conclusion: For Modern IT to Affect the Schools We Need a Shift in Perspective

Without a doubt, the Internet has created a revolution in the cost of information and the ease with which information is accessed. Virtually every aspect of the American economy is being transformed by the diffusion of Internet-based technologies—but we have argued that most Internet technologies that have been developed for schools have been designed to deliver information to individuals and not aimed at community-building. While cheap information is essential for the efficiency of any market for private goods, it is *not necessarily sufficient* for the operation of markets for public goods, including education, and it is clearly by itself *not sufficient* for strengthening democratic practices. We believe that given this, a shift in perspective—from parents as *consumers* to parents as *citizens*—is required.

There are two important bases for this shift. First, in contrast to buying most private goods, a choice of a school for one's child is not a one-time "spot purchase." Education is a continual process that takes place over years and in multiple venues. Second high quality education requires "coproduction"—the education of our children is not an activity that can be managed by professional educators alone. Because much of the educational process takes place at home, schools are unlikely to succeed without the active assistance of parents, both in school activities and at home. Children learn from their teachers, but they also learn from other children in their classes and from their parents. The broader community also has a stake in this learning process. As Ostrom

(1996: 1079) points out: "If students are not actively engaged in their own education, encouraged and supported by their family and friends, what teachers do may make little difference in the skills students acquire."(Also see Henig 1994; Marschall 1998; Schneider et al. 2000, chapter 2).

Once we recognize that quality education is built on coproduction then we must use our new technological tools to enhance the relationships between parents, students and teachers, and to increase levels of cooperation between these coproducers. In turn, this perspective requires parents to become more involved in schooling and highlights the importance of shifting power away from central administrators toward school buildings, classrooms, and homes (e.g., Chubb and Moe 1990). From this perspective, existing Internet sites are built on too limited a view of parents as individual "atomistic" consumers and not as integral parts of a larger community with broader communal interests and stakes in education.

We argue that schools must be viewed as communities in which all members must take a more active role. The next generation of Internet sites must encourage these interactions. Properly conceived, we believe that these Internet sites can build the virtuous circle. Thus, the revolutionary impact of the Internet can be harnessed only by reconceptualizing and broadening the role of parents in the educational process and then by designing school-based sites that support the role of parents as active and involved citizens who are critical to the success of schools and education.

But while we argue that these types of sites have greater potential to cross the digital divide by developing information and action components in close conjunction with the real needs of real communities seeking to improve their local schools, we also recognize that there still remain financial and logistical barriers to the creation of such sites. Perhaps the most promising example is Edison Schools' commitment that all children in their schools above the third grade have laptop computers and connection to Edison's intranet, The Common. This is a concrete action to cross the digital divide by increasing computer literacy and by placing computers in the homes of students (and not incidentally creating live-in "support staff" for parents trying to become computer literate).

While Edison only has a small number of schools compared to the needs we have identified, their commitment to computer-aided education is spreading and many traditional public schools are responding.[22] And we can only hope that the falling cost of computers and Internet connectivity will further reduce the barriers leading to the digital divide. But if there is any policy domain with the content that can *potentially* lead parents to actively seek to cross the digital divide it is education—and

[22] For example, in September 2000, New York City's Board of Education announced a $1 billion plan to do the same thing for their students, but finding the money and implementing the plan are still in the future.

to the extent that the next generation of Internet sites look like the ones we envision, the opportunities for parents to use the Internet to help build strong schools and strong communities will increase even further.

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Appendix 1: The Digital Divide

The rapid growth of the "new economy" over the last several years has led to a growing number of both publicly- and privately-funded studies examining who has access to the Internet, what they use it for, and how often. Perhaps the most widely cited is *Falling Through the Net: Defining the Digital Divide*, which was published in July of 1999 by the U.S. Department of Commerce. This report, which is based on survey data from special questions added to the Census Bureau's December 1998 Current Population Survey, presents literally hundreds of tables documenting computer ownership, Internet access, and Internet usage for a representative sample of American households. While limitations of space preclude us from listing the detailed finding here, the following excerpt from the report's executive summary highlights the most salient details:

> The 1998 data reveal significant disparities, including the following:
>
> - Urban households with incomes of $75,000 and higher are more than *twenty times* more likely to have access to the Internet than rural households at the lowest income levels, and more than *nine times* as likely to have a computer at home.
> - Whites are more likely to have access to the Internet from home than Blacks or Hispanics have from *any* location.
> - Black and Hispanic households are approximately *one-third* as likely to have home Internet access as households of Asian/Pacific Islander descent, and roughly *two-fifths* as likely as White households.
> - Regardless of income level, Americans living in rural areas are lagging behind in Internet access. Indeed, at the lowest income levels, those in urban areas are more than twice as likely to have Internet access than those earning the same income in rural areas.
>
> For many groups, the digital divide has *widened* as the information "haves" outpace the "have nots" in gaining access to electronic resources. The following gaps with regard to home Internet access are representative:
>
> - The gaps between White and Hispanic households, and between White and Black households, are now approximately five percentage points larger than they were in 1997.
> - The digital divide based on education and income level also increased. Between 1997 and 1998, the divide between those at the highest and lowest education levels increased 25 percent, and the divide between those at the highest and lowest income levels grew 29 percent.
>
> Nevertheless, the news is not all bleak. For Americans with incomes of $75,000 and higher, the divide between Whites and Blacks has actually narrowed considerably in the last year. This finding suggests that the most affluent American families, irrespective of race, are connecting to the Net. If prices of computers and the Internet decline further, the divide

between the information "haves" and "have nots" may continue to narrow (U.S. Department of Commerce, 1999)

Clearly, these data both strongly support the idea of several technology divides among American households and detail the specific fault lines on which these gaps are situated. Nevertheless, some researchers have taken issue with the Department of Commerce's specification of the digital divide and have advanced alternative results. The Stanford Institute for the Quantitative Study of Society, for example, published a report in February, 2000, which specifically challenged previous findings on the digital divide.

The Stanford report, which is based on data gathered electronically from approximately 4000 WebTV users by the commercial firm Intersurvey, states:

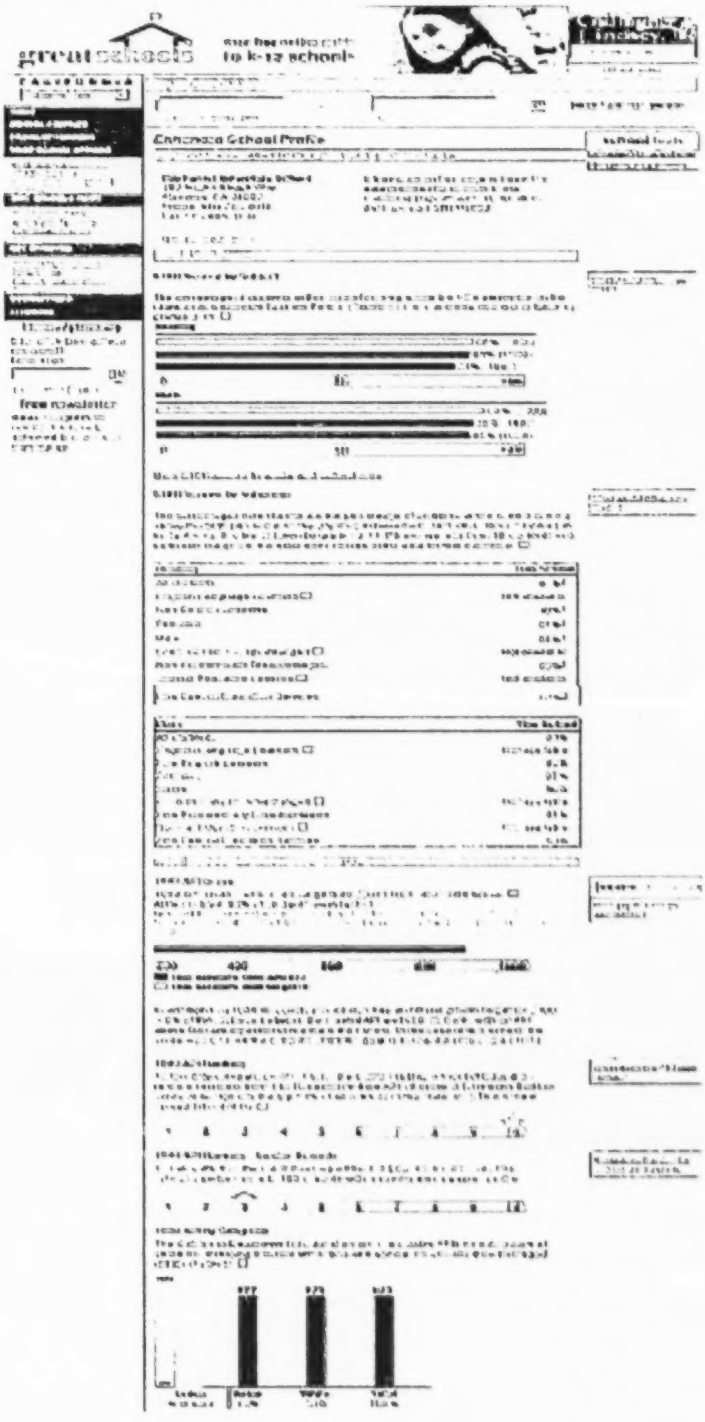
- There are <u>some</u> demographic differences in Internet <u>access</u>.

  21 percent of differences in Internet access can be explained by demographic factors. By far *the most important factors facilitating or inhibiting Internet access are education and age*, and not income - nor race/ethnicity or gender, each of which account for less than 5 percent change in rates of access and are statistically insignificant. By contrast, a college education boosts rates of Internet access by well over 40 percentage points compared to the least educated group, while people over 65 show a more than 40 percentage point drop in their rates of Internet access compared to those under 25. Age really reflects generational differences, and thus shows what to expect in the future.

- There are <u>few</u> demographic differences in Internet <u>use</u>.

  Only 6 percent of differences in Internet use can be explained by demographic factors: Thus, *once people are connected to the Net they hardly differ in how much they use it and what they use it for* - except for a drop-off after age 65, and a faint hint of a gender gap. Demographic differences in Internet use involve at most an hour and a half a week, mainly reflecting people's time budgets and work status; and they involve hardly more than half an additional Internet activity, in the latter case reflecting levels of education. Instead - and above all - Internet use increases dramatically, both in terms of amount of time and in terms of range of activities, the longer people have been connected to the Internet, and this fact will make for steady growth in the future (Stanford Institute for the Quantitative Study of Society, 2000, emphasis original).

Appendix 2: Standardizing Test Scores



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